

SEGATM SERVICE MANUAL

GENESIS 32X(VA0,VA1) / MEGA DRIVE 32X



NO.	012
ISSUED	JUNE, 1995

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Sega Enterprises, Ltd.

BEFORE REFERRING TO THE SERVICE MANUAL.

Since the circuit of the Extension Unit used in the GENESIS 32X has been integrated on the main circuit board, an Extension Unit is not necessary for the GENESIS 32X(VA1).

This circuit is built into the MEGA DRIVE 32X from the first unit.

1. SPECIFICATIONS

Ratings

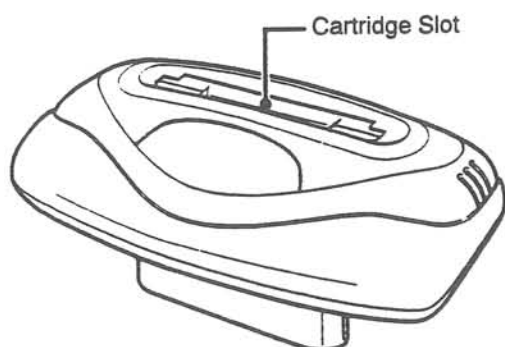
Model	GENESIS 32X	MEGA DRIVE 32X	
		PAL	PAL G/I
Power input	Input: AC120 V, 60 Hz Output: DC10 V, 850 mA	Input: AC230 V, 50 Hz Output: DC10 V, 850 mA	Input: AC240 V, 50 Hz Output: DC9 V, 850 mA
Power consumption	Approx. 4 W	Approx. 4 W	Approx. 4 W
Operating environment	Temperature: 5 °C ~35 °C Humidity: 20%RH~80%RH (no condensation)		
Dimensions	115(W) × 210(L) × 100(H) mm		

Specifications

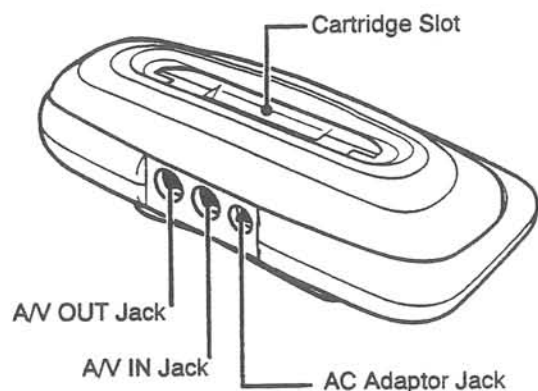
CPU	Master	32bit RISC SH2 23 MHz 20MIPS
	Slave	32bit RISC SH2 23 MHz 20MIPS
Memories	RAM	2Mbit (SDRAM)
	VRAM	2Mbit
Sound	PWM Sound Source (Stereo)	
Display capability	VDP	SEGA custom LSI
	Display	TV
	Color	32,768 colors
	Video Output	VIDEO RF RGB
Slots	Cartridge slots	

2. IDENTIFYING PARTS







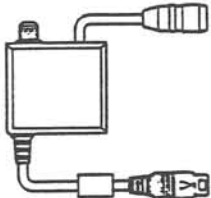

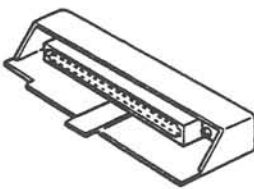
Front View



Rear View



3. ACCESSORIES

 <p>Connector Cable</p>	 <p>Conversion Cable</p>	 <p>Audio/Video Cable (Mono)</p>
 <p>Spacer for GENESIS II /MEGA DRIVE II</p>	 <p>AC Adaptor</p>	 <p>Electromagnetic Shield Plates</p>
 <p>RF Unit (PAL version except for France)</p>	 <p>Mono Cable Scart (France only)</p>	 <p>Extension Unit (Only GENESIS 32X VA0)</p>

4. DISASSEMBLY

4-1. Top Case Removal (See Fig. 4-1)

- 1) Remove four screws (A) and the top case.

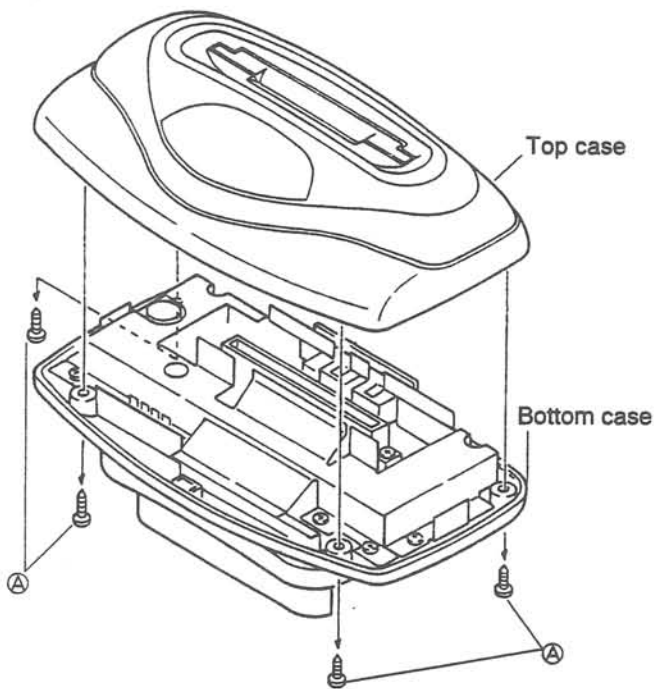


Fig.4-1

4-2. Sub Board Removal (See Fig. 4-2)

- 1) Remove ten screws (B) attached the top shield case.
- 2) Remove two screws (C) attached the 64-pin connector.
- 3) Remove two 40-pin flat cables on the sub board.
- 4) Remove the sub board shown as arrow.

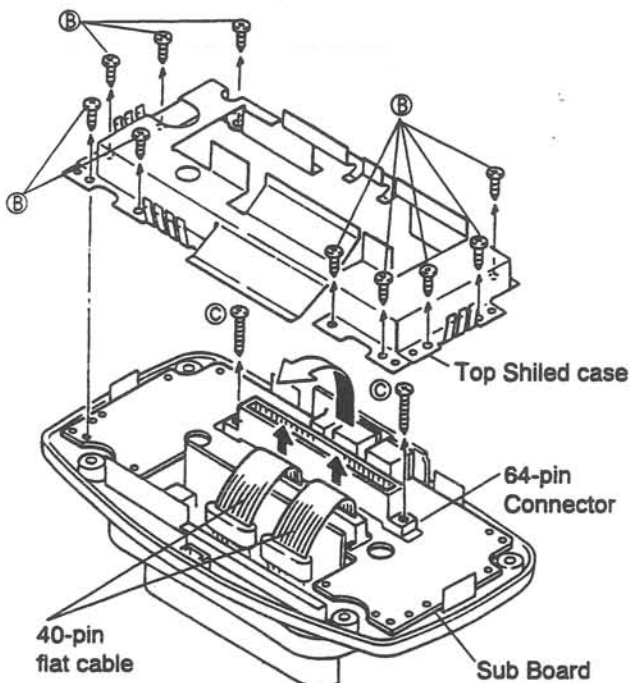


Fig.4-2

4-3. Main Board Removal (See Fig. 4-3, 4-4)

- 1) Remove four screws (D) attached the front case and rear case on the bottom case and then their shown as arrow.
- 2) Remove two screws (E) attached the front case and rear case and main board.

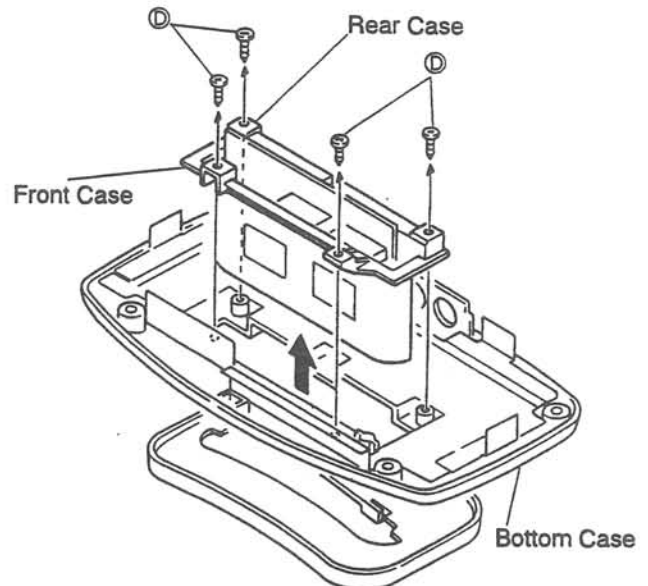


Fig.4-3

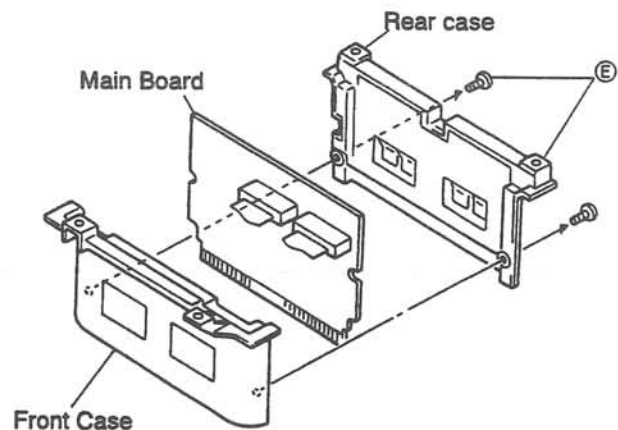


Fig.4-4

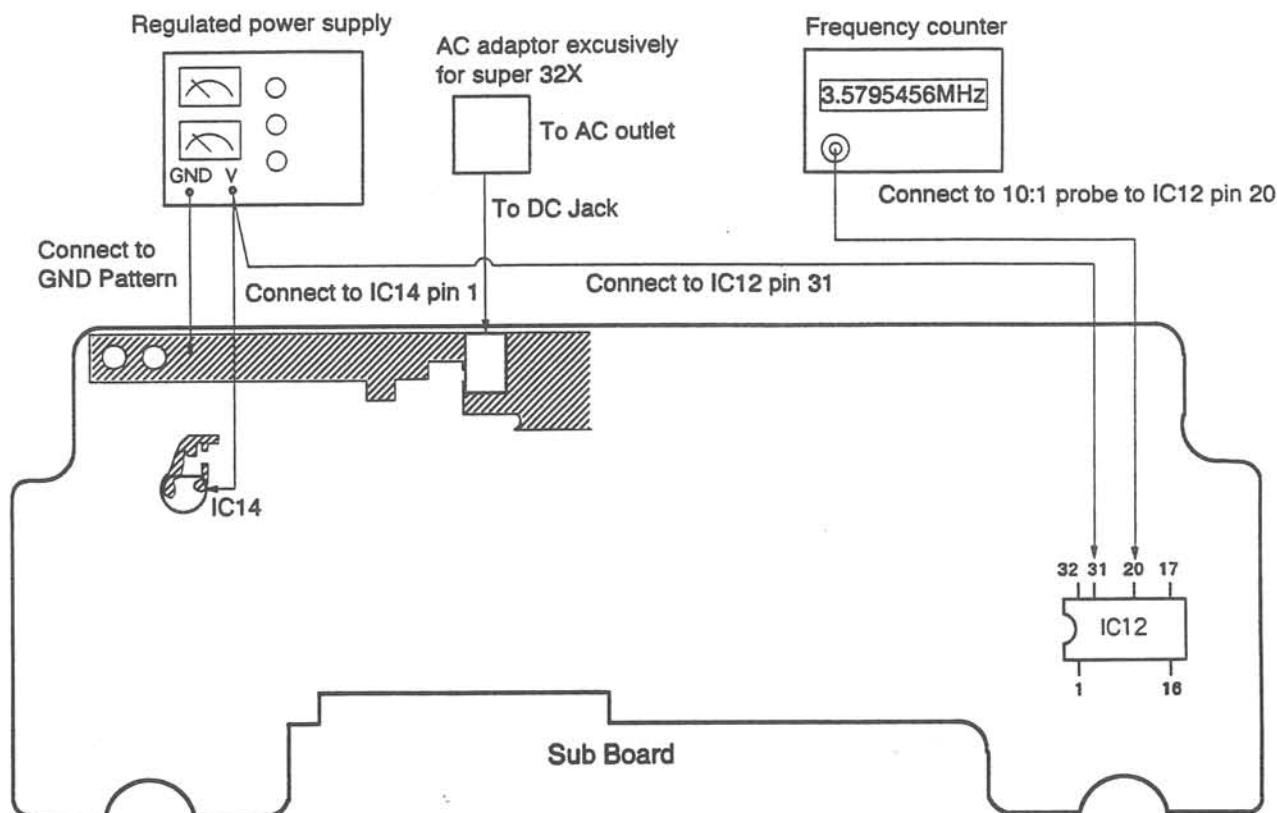
5. ADJUSTMENT

Video Frequency Matching Adjustment

Test equipment and tools for adjustment

1. Regulated power supply (5V DC)
2. Frequency counter (capable of displaying 7 digits or more)
3. 10:1 oscilloscope probe
4. Philips screwdriver
5. Non-metal adjustment driver
6. AC adaptor exclusively for super 32X
7. One lead for GND and two leads for 5V

Connections of test equipment

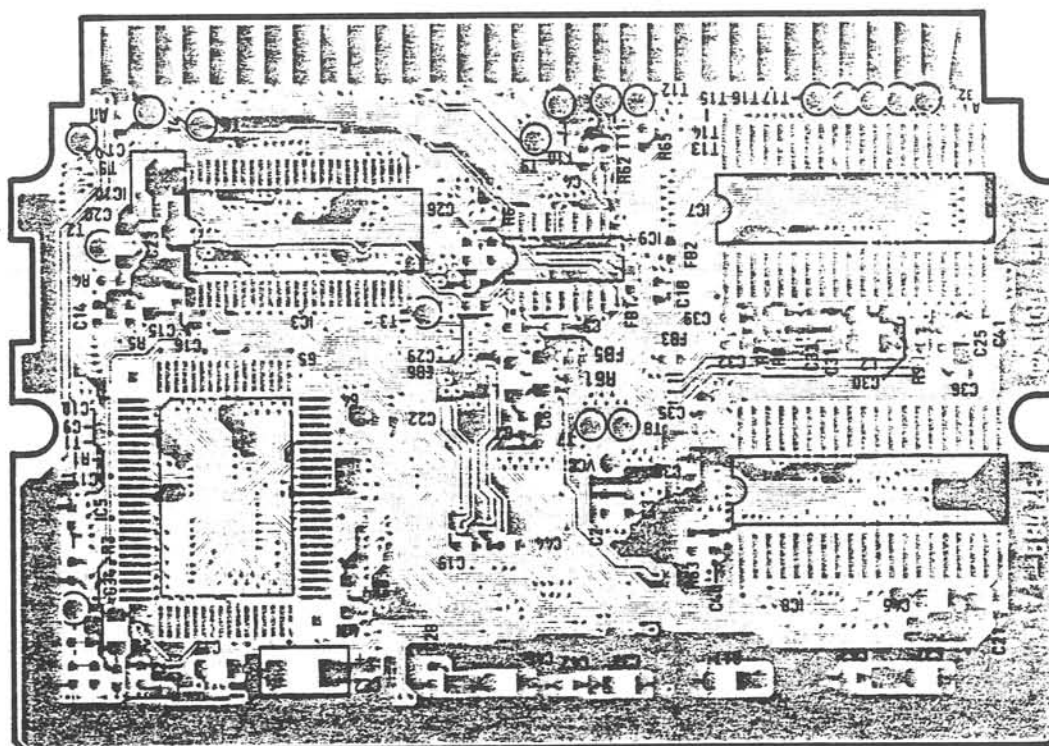
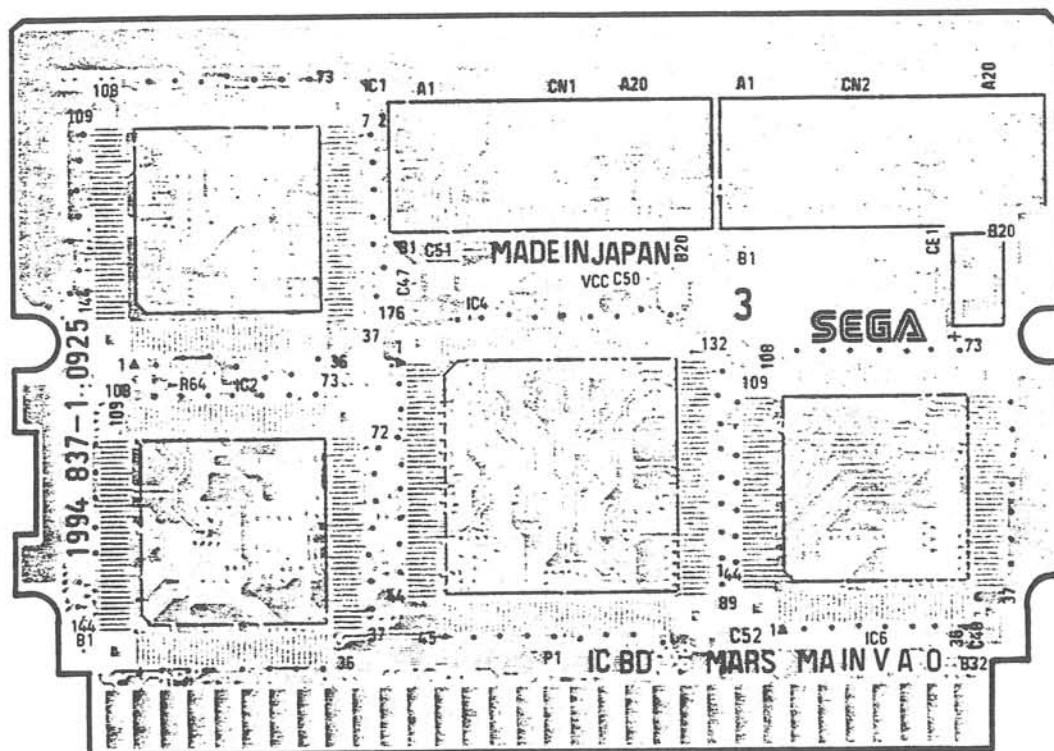


Adjustment procedure

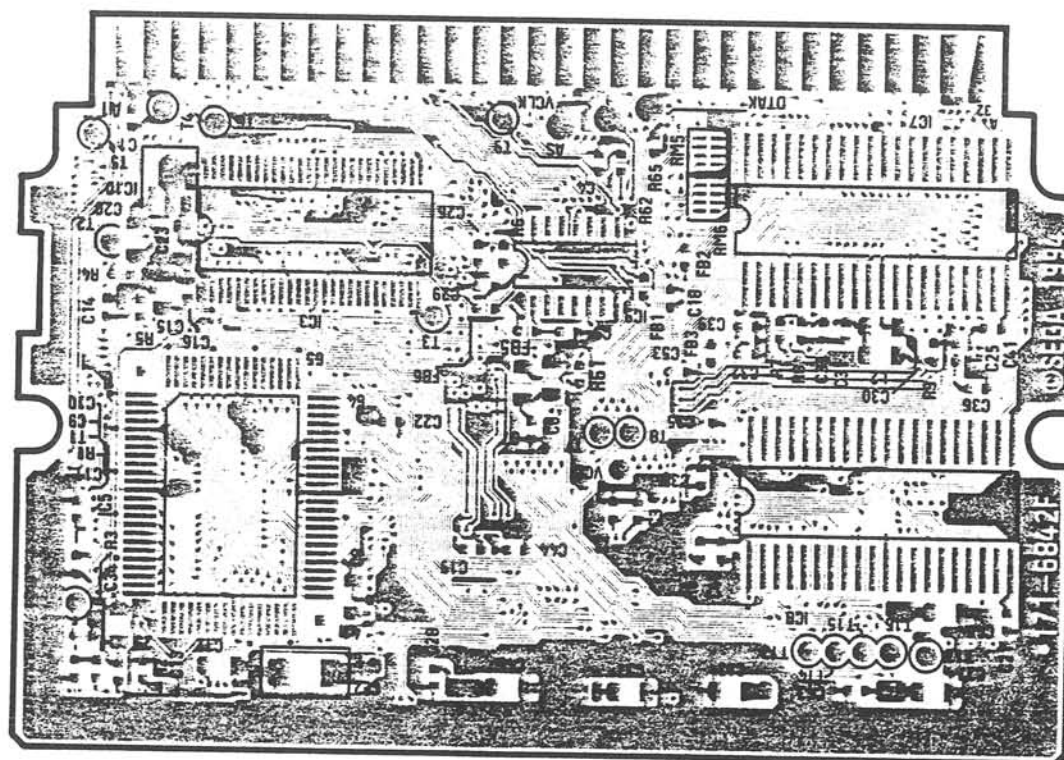
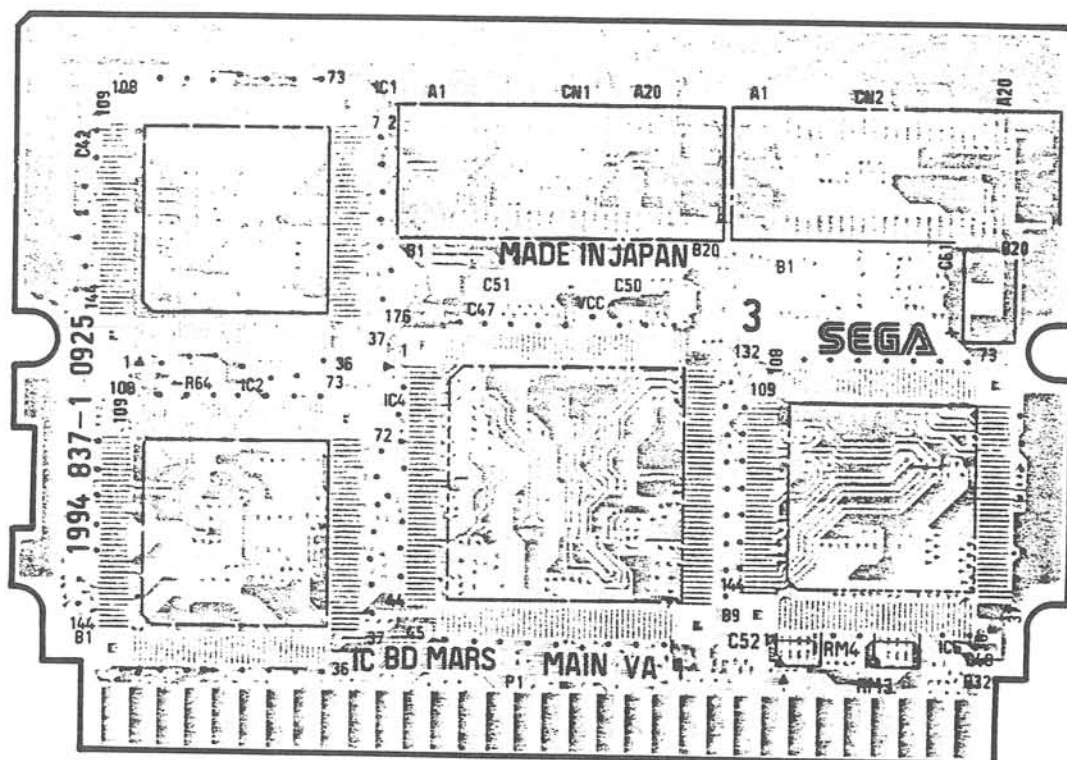
1. Disconnect the super 32X from the Mega Drive.
2. Remove the top case and top shield case from the super 32X.
3. Plug the AC adaptor into an AC outlet and into the DC jack.
4. Set the regulated power supply to 5V DC and connect it to IC14 pin 1. (The super 32X turns on.)
5. Connect 5V DC to IC12 pin 31. (Set to the test mode.)
6. Connect the frequency counter to IC12 pin 20 and adjust C72 so the frequency is $3.579545 \text{ MHz} \pm 10\text{Hz}$.

MEMO

7-2. Circuit Board Diagram (Main Board) VA0

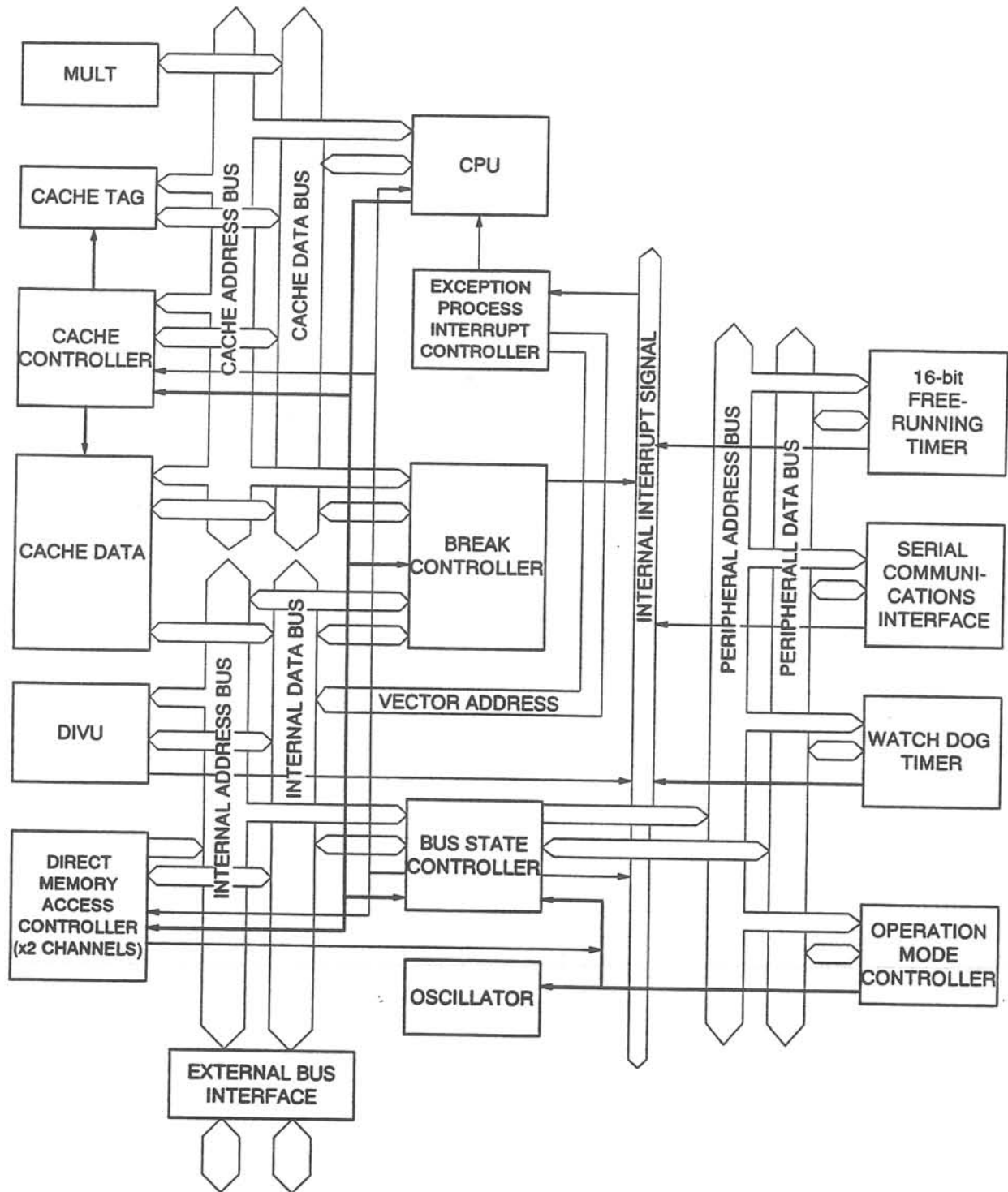


1
2
3
4
5
6



No.	I/O	Pin Name	Function
104	–	VCC (PLL) 12	Power supply (5V) of built-in PLL
105	I	MD0	Operation mode pin
106	–	VSS (PLL) 15	Power supply (0V) of built-in PLL
107	I	MD1	Operation mode pin
108	O	CAP1	External capacitor connection pin for PLL
109		CAP2	
110	I	MD2	Operation mode pin
111	O	CKPACKN	Clock pause acknowledge output.
112	I	CKPREQ $\overline{\text{N}}$	Clock pause request input.
113	–	VCC13	Power supply (5V)
114	I	N.C	Not connectes.
115	–	VSS16	Power supply (0V)
116	O	N.C	Not connectes.
117	I	MD3	Operation mode pin
118	I/O	CKIO	System clock input/output.
119	I	MD4	Operation mode pin
120		MD5	
121	–	VSS17	Power supply (0V)
122	I	RES	Reset
123	–	VCC14	Power supply (5V)
124	O	IVECF	Interrupt vector fetch cycle
125	I	NMI	Non-maskable interrupt request.
126	I	IRL3	External interrupt factor input.
127		IRL2	
128		IRL1	
129		IRL0	
130	I/O	D0	Data bus
131		D1	
132	–	VCC15	Power supply (5V)
133	I/O	D2	Data bus
134	–	VSS18	Power supply (0V)
135	I/O	D3	Data bus
136		D4	
137		D5	
138		D6	
139	–	VCC16	Power supply (5V)
140	I/O	D7	Data bus
141	–	VSS19	Power supply (0V)
142	I/O	D8	Data bus
143		D9	
144		D10	

■ Block Diagram

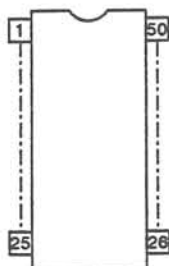


IC3 2Mbit SDRAM

IC UPD4502161G5-A12 TSOP

Parts No. : 315-0910-12

Top View



Description

No.	I/O	Pin Name	Function
35	I	CLK	CLK is the master clock input pin. The other inputs signals are referenced at CLK rising edge.
18	I	\overline{CS}	\overline{CS} low start the command input cycle. When \overline{CS} is high, all input are not referenced. But even if \overline{CS} is high, internal operations i.e. bank active or burst are not changed.
15	I	\overline{WE}	\overline{RAS} \overline{CAS} \overline{WE} have the same names with conventional DRAM. But these pins have deferent definitions with conventional ones. All of these pins only define command cycle definition. For detail information see command table.
16		\overline{CAS}	
17		\overline{RAS}	
21	I	A0	Row address (AX0-AX6, AX8) is determined by A0-A8 input signal level at the rising edge CLK signal at the bank active command cycle (state of AX7 is not applicable). Column address (AY0-AY7) is determined by A0-A7 input signal level at a read or write command cycle. The column address will be used as the burst access start address. A8 define precharge mode, – Precharge command cycle: A8 = Low: Both bank precharged. A8 = High: One bank precharged (depends on state of A9) – Read/write command cycle: A8 = High: Precharge cycle is started automatically following the end of data transfer in burst mode.
22		A1	
23		A2	
24		A3	
27		A4	
28		A5	
29		A6	
30		A7	
20		A8	
19	I	A9	A9 is bank select signal (BS). In command cycle, A9=low select bank A and A9=High select bank B.
34	I	CKE	CKE determine next CLK is valid or not. If CKE is high next CLK rising edge is valid. But if CKE is low, next CLK is invalid. If CLK rising edge is invalid, internal clock is not asserted and μ PD4504161 becomes halt operation. And when μ PD4502161 dose not in burst mode and CKE is negated, μ PD4502161 enter power down mode. During power down mode CKE must keep low level.
36	I	DQMU	DQMU control Upper byte and DQML controls Lower byte input/output buffers. In read mode, DQMU, DQML control output buffer impedance like conventional \overline{OE} . If DQMU DQML is High, output buffers become high impedance. If DQMU, DQML is Low, output buffers become low impedance. And when device in write mode, DQMU, DQML control word mask. If DQMU, DQML is High input data is not written to memory cell. If DQMU, DQML is Low input data is written to memory cell.
14		DQML	

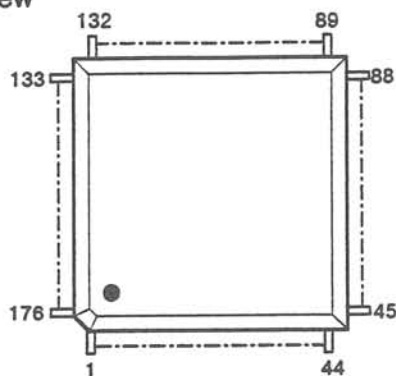
No.	I/O	Pin Name	Function
2	I/O	DQ0	I/O pins are the same as conventional DRAM.
3		DQ1	
5		DQ2	
6		DQ3	
8		DQ4	
9		DQ5	
11		DQ6	
12		DQ7	
39		DQ8	
40		DQ9	
42		DQ10	
43		DQ11	
45		DQ12	
46		DQ13	
48		DQ14	
49		DQ15	
1	—	V _{CC}	Power supply of internal circuits.
7			
13			
25			
38			
44			
4	—	V _{SS}	Power supply of internal circuits.
10			
26			
41			
47			
50			
31, 32	—	GND	Ground pins

IC4

IC CUSTOM CHIP G/A MARS I/F
Parts No. : 315-5818

IC CUSTOM CHIP SCA MARS I/F
Parts No.: 315-5818A

Top View



Discription

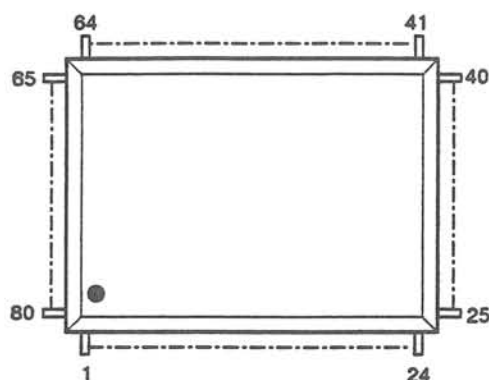
No.	I/O	Pin Name	No.	I/O	Pin Name	No.	I/O	Pin Name	No.	I/O	Pin Name
1	—	VDD	45	—	GND	89	—	VDD	133	—	GND
2	O	CH0	46	—	GND	90	I/O	VD8	134	—	GND
3	O	CH1	47	I	SHA10	91	I/O	VD6	135	I/O	AD0
4	O	OVA19	48	I	SHA11	92	I/O	VD1	136	I/O	AD1
5	O	OVA20	49	I	SHA12	93	I/O	VD9	137	I/O	AD2
6	I	OVA21	50	I	SHA13	94	I/O	VD5	138	I/O	AD3
7	I	CART	51	I	SHA14	95	I/O	VD2	139	I/O	AD4
8	I/O	KILL	52	I	SHA15	96	I/O	VD10	140	I/O	AD5
9	I/O	SHD15	53	I	SHA16	97	I/O	VD4	141	I/O	AD6
10	I/O	SHD14	54	I	SHA17	98	I/O	VD3	142	I/O	AD7
11	I/O	SHD13	55	O	WAIT	99	I/O	VD11	143	I/O	AD8
12	I/O	SHD12	56	I	RD	100	I	MRES	144	I/O	AD9
13	I/O	SHD11	57	I	DQMLL	101	I	VA19	145	I/O	AD10
14	I/O	SHD10	58	I	DQMLU	102	I	VA20	146	I/O	AD11
15	I/O	SHD9	59	I	RDXWR	103	I	VA21	147	I/O	AD12
16	I/O	SHD8	60	I	BS	104	I	VA22	148	I/O	AD13
17	I/O	SHD7	61	I	CS2	105	I	VA23	149	I/O	AD14
18	I/O	SHD6	62	I	CS1	106	I	CAS0	150	I/O	AD15
19	I/O	SHD5	63	I	CS0S	107	I	CE0	151	O	SEL
20	I/O	SHD4	64	I	CS0M	108	I	AS	152	I	CHPLL
21	I/O	SHD3	65	O	DREQ1	109	O	DTACK	153	I	BURNI
22	—	VDD	66	O	DREQ0	110	—	VDD	154	O	OCE0
23	—	GND	67	I	VA18	111	—	GND	155	O	OASEL
24	I/O	SHD2	68	I	VA17	112	I	VCLK	156	O	OCAS2
25	I/O	SHD1	69	I	VA16	113	I	CAS2	157	O	OCAS0
26	I/O	SHD0	70	I	VA15	114	I/O	VD15	158	O	OLWR
27	O	SIPL1	71	I	VA14	115	I/O	VD14	159	I/O	RD0
28	O	SIRL2	72	I	VA13	116	I/O	VD13	160	I/O	RD1
29	O	SIRL3	73	I	VA12	117	I/O	VD12	161	I/O	RD2
30	O	MIRL1	74	I	VA11	118	I	ASEL	162	I/O	RD3
31	O	MIRL2	75	I	VA10	119	I	VRES	163	I/O	RD4
32	O	MIRL3	76	I	VA9	120	I	LWR	164	I/O	RD5
33	O	CKIO	77	I	VA8	121	I	UWR	165	I/O	RD6
34	O	SHRES	78	I	VA7	122	I	HINT	166	I/O	RD7
35	I	SHA1	79	I	VA6	123	I	VINT	167	I/O	RD8
36	I	SHA2	80	I	VA5	124	I	VACK	168	I/O	RD9
37	I	SHA3	81	I	VA4	125	O	ACCS	169	I/O	RD10
38	I	SHA4	82	I	VA3	126	O	DIR	170	I/O	RD11
39	I	SHA5	83	I	VA2	127	O	RW	171	I/O	RD12
40	I	SHA6	84	I	VA1	128	O	OUWR	172	I/O	RD13
41	I	SHA7	85	I/O	VD7	129	—	AVDD	173	I/O	RD14
42	I	SHA8	86	I/O	VD0	130	—	AGND	174	I/O	RD15
43	I	SHA9	87	—	GND	131	O	C23	175	—	GND
44	—	VDD	88	—	GND	132	—	VDD	176	—	GND

IC5 ADDRESS SELECTOR

IC CUSTOM CHIP MARS ADSE

Parts No. : 315-5805

■ Top View



■ Description

No.	I/O	Pin Name	No.	I/O	Pin Name	No.	I/O	Pin Name	No.	I/O	Pin Name
1	O	RA4	21	I	VA9	41	I	SHA2	61	O	RA22
2	O	RA3	22	I	VA8	42	I	SHA3	62	O	RA21
3	O	RA2	23	I	VA7	43	I	SHA4	63	O	RA20
4	O	RA1	24	I	VA6	44	I	SHA5	64	O	RA19
5	—	GND	25	I	VA5	45	I	SHA6	65	O	RA18
6	I	VA23	26	I	VA4	46	I	SHA7	66	O	RA17
7	I	VA22	27	I	VA3	47	I	SHA8	67	O	RA16
8	I	OVA21	28	I	VA2	48	I	SHA9	68	O	RA15
9	I	OVA20	29	I	VA1	49	I	SHA10	69	O	RA14
10	I	OVA19	30	I	SHA21	50	I	SHA11	70	O	RA13
11	I	VA18	31	I	SHA20	51	I	SHA12	71	—	GND
12	—	GND	32	I	CKI0	52	I	SHA13	72	—	VDD
13	I	VA17	33	—	GND	53	—	GND	73	O	RA12
14	I	VA16	34	—	VDD	54	I	SHA14	74	O	RA11
15	I	VA15	35	I	BREQ	55	I	SHA15	75	O	RA10
16	I	VA14	36	I	IBACK	56	I	SHA16	76	O	RA9
17	I	VA13	37	O	OBACK	57	I	SHA17	77	O	RA8
18	I	VA12	38	I	SHA19	58	I	SEL	78	O	RA7
19	I	VA11	39	I	SHA18	59	—	GND	79	O	RA6
20	I	VA10	40	I	SHA1	60	O	RA23	80	O	RA5

IC6 8bit 20MHz D/A CONVERTER

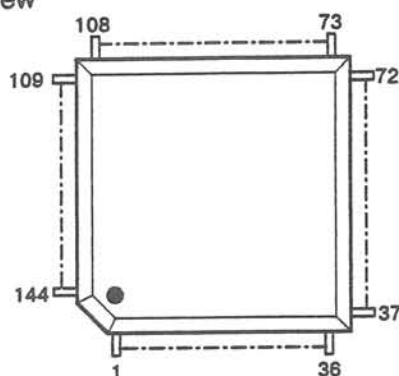
IC CUSTOM CHIP G/A MARS VDPNEC

Parts No. : 315-5781

IC CUSTOM CHIP SCA MARS VDP

Parts No. : 315-5781A

■ Top View



■ Description

No.	I/O	Pin Name	No.	I/O	Pin Name	No.	I/O	Pin Name	No.	I/O	Pin Name
1	—	VDD	37	—	GND	73	—	VDD	109	—	GND
2	—	VDD	38	—	GND	74	—	VDD	110	—	GND
3	—	VDD	39	I/O	AD15	75	—	VDD	111	I	DGND
4	I/O	OD0	40	I/O	AD14	76	—	N.C	112	—	N.C
5	I/O	OD1	41	I/O	AD13	77	O	EA7	113	I	AGND1
6	I/O	OD2	42	I/O	AD12	78	O	EA6	114	—	N.C
7	I/O	OD3	43	I/O	AD11	79	O	EA5	115	I	AVDD1
8	I/O	OD4	44	I/O	AD10	80	O	EA4	116	—	N.C
9	I/O	OD5	45	I/O	AD9	81	O	EA3	117	O	IOR
10	I/O	OD6	46	I/O	AD8	82	O	EA2	118	—	N.C
11	I/O	OD7	47	I/O	AD7	83	O	EA1	119	I	AVDD2
12	I/O	OD8	48	I/O	AD6	84	O	EA0	120	—	N.C
13	I/O	OD9	49	I/O	AD5	85	O	EUWE	121	I	AGND2
14	I/O	OD10	50	I/O	AD4	86	O	ELWE	122	—	N.C
15	I/O	OD11	51	I/O	AD3	87	O	EOE	123	O	IOG
16	I/O	OD12	52	I/O	AD2	88	O	ECAS	124	—	N.C
17	I/O	OD13	53	I/O	AD1	89	O	ERAS	125	I	IREF
18	I/O	OD14	54	I	AD0	90	I/O	ED15	126	—	N.C
19	I/O	OD15	55	I	TEST3	91	I/O	ED14	127	I	VREF
20	O	ORAS	56	I	C23	92	I/O	ED13	128	—	N.C
21	O	OCAS	57	I	MODE2	93	I/O	ED12	129	I	COMP
22	O	OOE	58	I	RW	94	I/O	ED11	130	—	N.C
23	O	OLWE	59	I	DIR	95	I/O	ED10	131	O	IOB
24	O	OUWE	60	O	VACK	96	I/O	ED9	132	—	N.C
25	O	OA0	61	I	ACCS	97	I/O	ED8	133	I	AVDD3
26	O	OA1	62	O	HINT	98	I/O	ED7	134	—	N.C
27	O	OA2	63	O	VINT	99	I/O	ED6	135	I	AGND3
28	O	OA3	64	I	MRES	100	I/O	ED5	136	—	N.C
29	O	OA4	65	I	HSYNC	101	I/O	ED4	137	I	DVDD
30	O	OA5	66	I	VSYN	102	I/O	ED3	138	—	N.C
31	O	OA6	67	I	YS	103	I/O	ED2	139	I	TEST1
32	O	OA7	68	I	NTSC	104	I/O	ED1	140	I	TEST2
33	I	MODE1	69	I	EDCLK	105	I/O	ED0	141	O	BFP
34	—	VDD	70	—	N.C	106	—	VDD	142	O	OYS
35	—	VDD	71	—	GND	107	—	VDD	143	—	GND
36	—	VDD	72	—	GND	108	—	VDD	144	—	GND

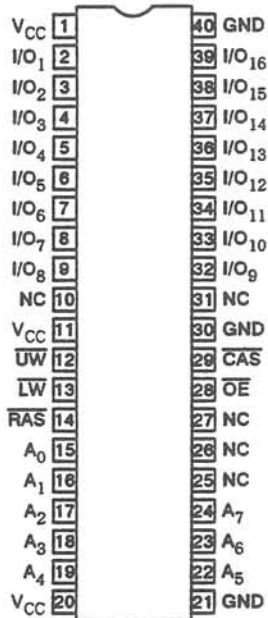
IC7/8 1Mbit CMOS DRAM

IC TC511664BJ-80 SOJ TOSHIBA
Parts No. : 315-0745-80

IC LC321664AJ-80 SOJ SANYO
Parts No. : 315-0961-80

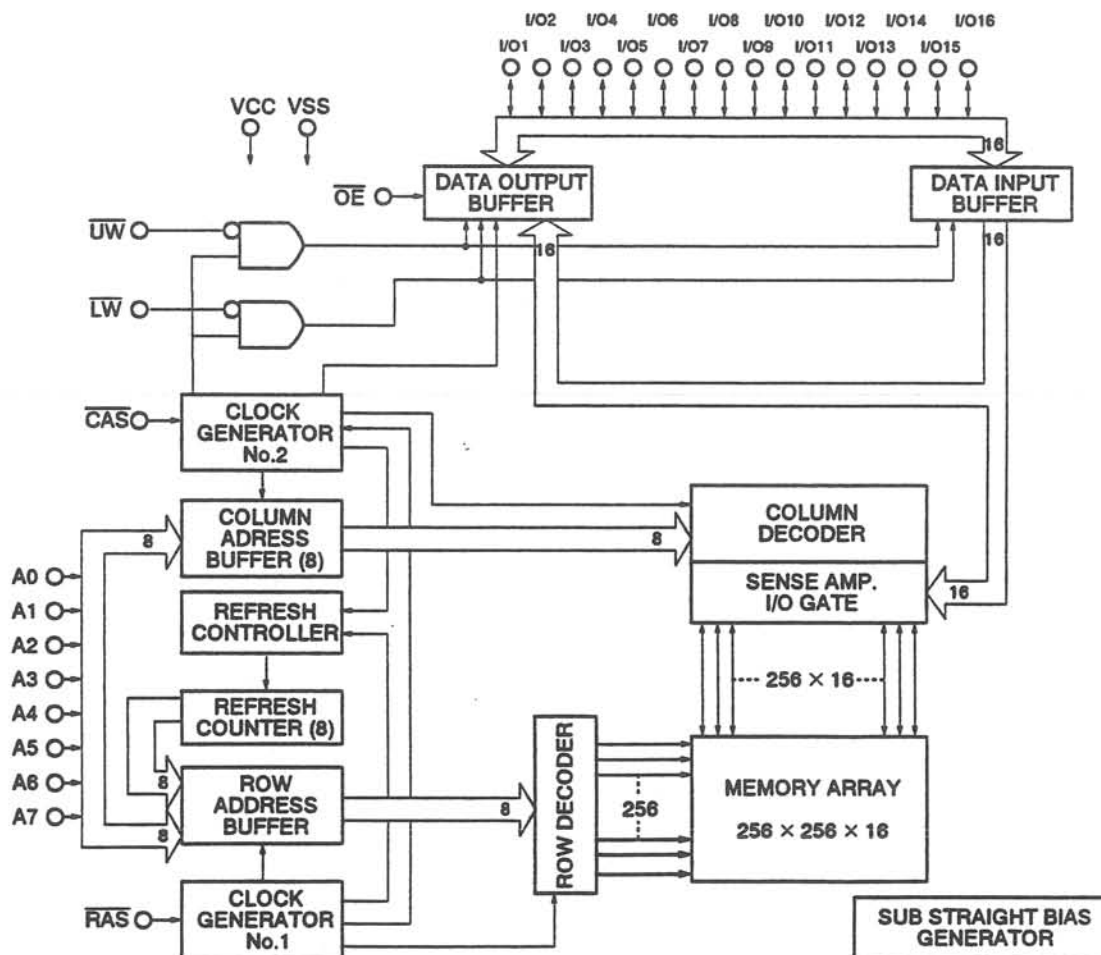
IC LC321664AM-80 SOP SANYO
Parts No. : 315-0962-80

Top View



A0-A7 : Address inputs
I/O1 - I/O16 : Data input/outputs
RAS : Row address strobe
CAS : Column address strobe
UW : Upper byte write enable
LW : Lower byte write enable
OE : Output enable
VCC : Power supply
GND : Ground
NC : Not connected

Description

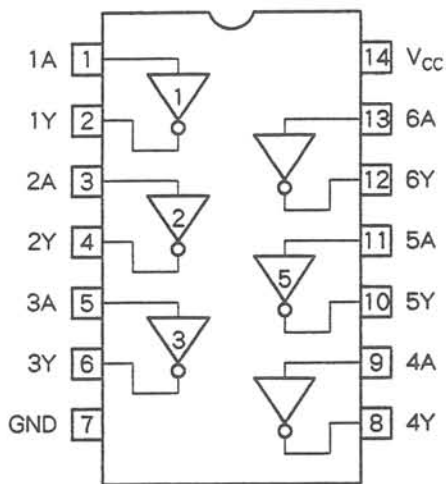


IC9 INVERTER

IC 74AC04 SOP 300MLL HITACHI

Parts No. : 314-0623

■ Top View



IC 74AC04 SOP 300MLL TOSHIBA

Parts No. : 314-0694

■ Truth Table

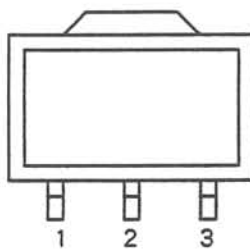
A	Y
L	H
H	L

IC10 3PIN REGULATOR

IC RH5RL33A

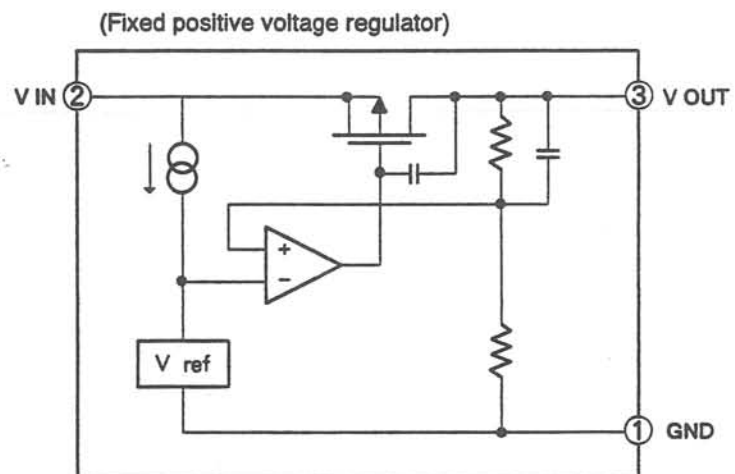
Parts No.: 313-5320

■ Top View



1: GND
2: IN
3: OUT

■ Block Diagram

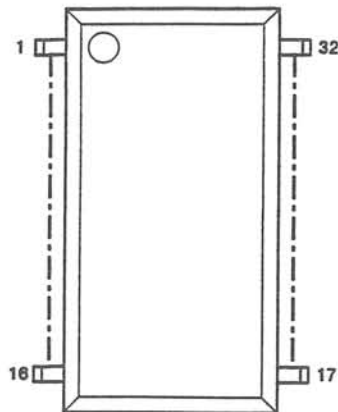


IC11 SOUND NETWORK/HEADPHONE AMP.

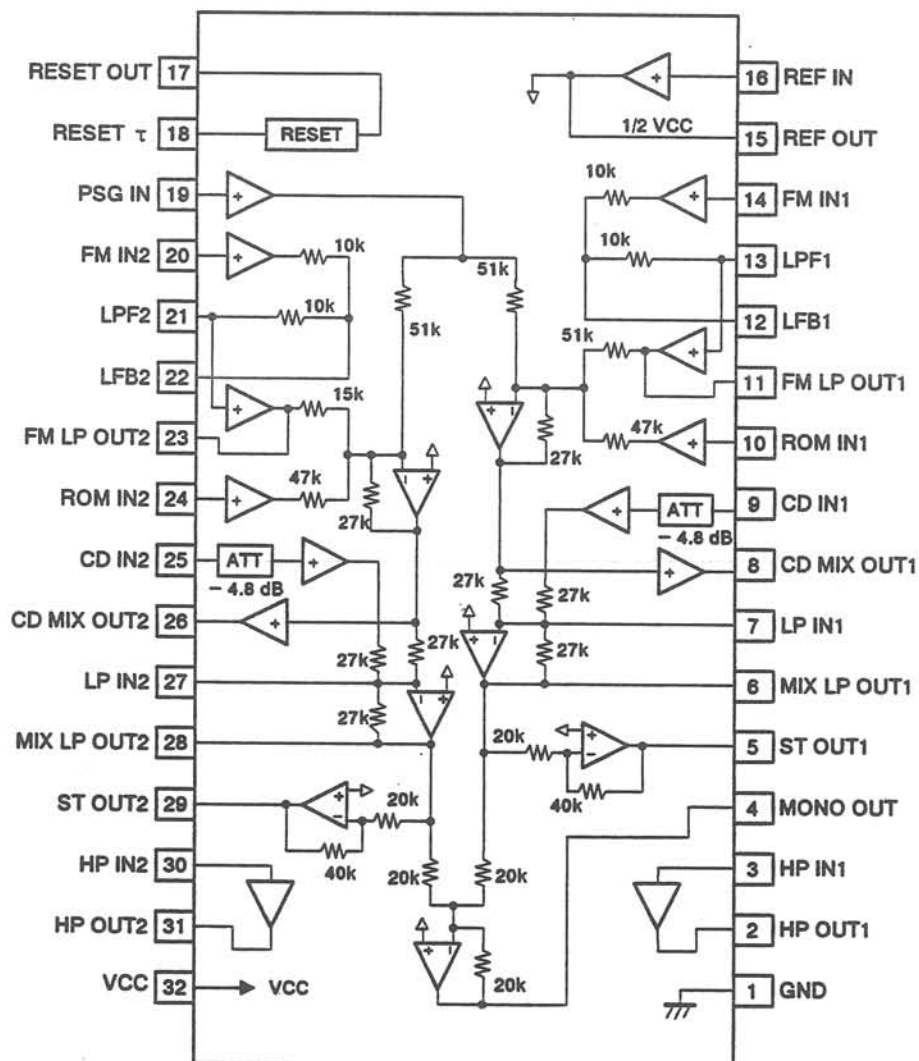
IC CUSTOM CP BA6166FS SOP ROHM

Parts No. : 315-5684

■ Top View



■ Pin Description and Block Diagram



IC12 VIDEO MIX

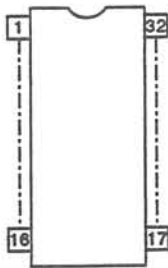
IC BA7237FS

Parts No. : 315-5788

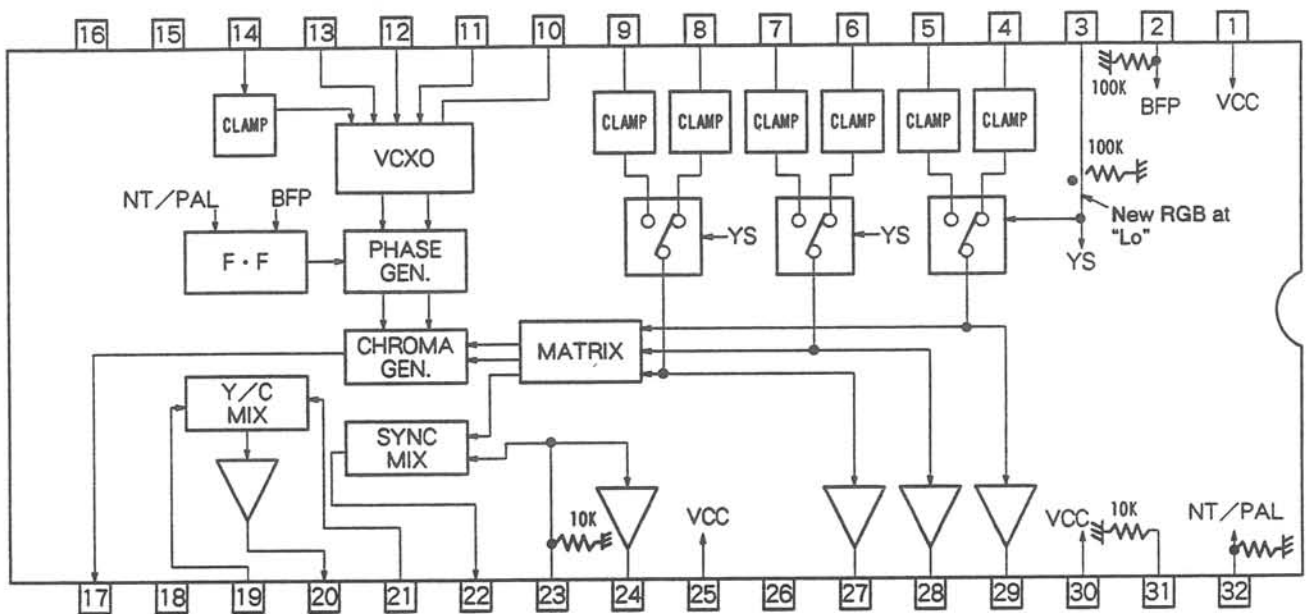
IC BA7237FSA

Parts No. : 315-5788A

■ Top View



■ Block Diagram



IC13 SWITCHING REGULATOR IC

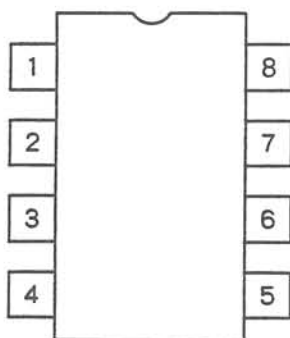
IC MC34063A SOP 8P

Parts No. : 313-5244

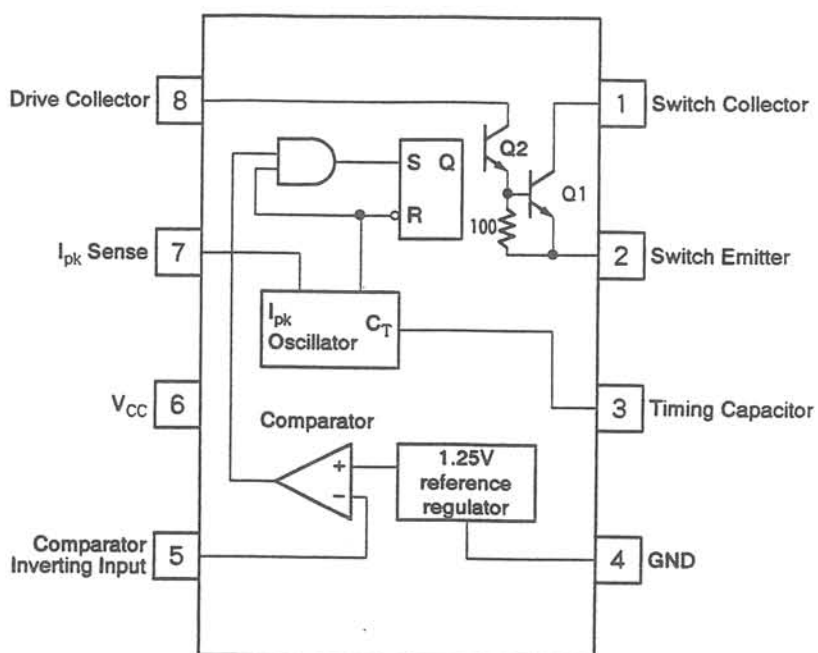
IC IR3MO3AN SOP 8P

Parts No. : 313-5335

■ Top View



■ Block Diagram



IC14 RESET IC

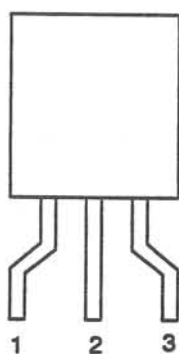
IC PST993E

Parts No. :313-5319

■ Top View

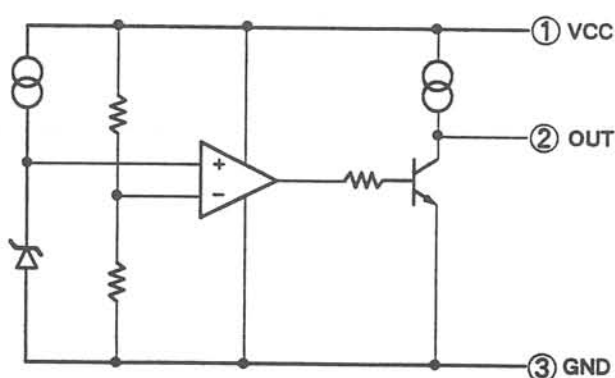


■ Front View



1: VCC
2: OUT
3: GND

■ Block Diagram

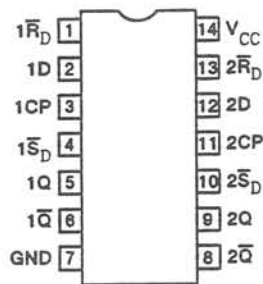


IC15

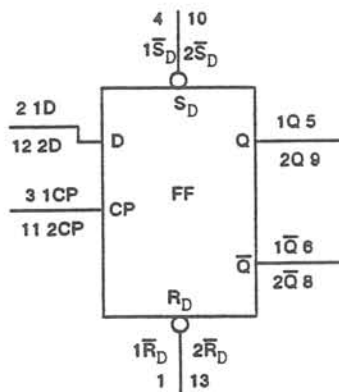
IC 74HC74 SOP 225MIL

Parts No. : 314-0647

■ Top View



■ Logic Symbol Diagram



■ Pin Description

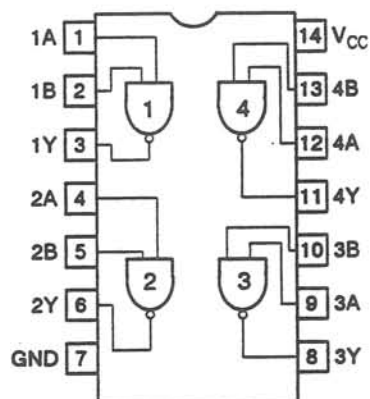
No.	I/O	Pin Name	Function
1, 13	I	$1\overline{R}_D, 2\overline{R}_D$	A synchronous reset direct inputs (active "Low").
2, 12	I	1D, 2D	Data inputs.
3, 11	I	1CP, 2CP	Clock inputs ("Low" to "High", triggered by edge).
4, 10	I	$1\overline{S}_D, 2\overline{S}_D$	A synchronous set direct inputs (active "Low").
5, 9	O	1Q, 2Q	True flip-flop outputs.
6, 8	O	$1\overline{Q}, 2\overline{Q}$	Complement flip-flop outputs.
7	—	GND	GND(0V)
14	—	V _{CC}	Positive (+) supply voltage

IC16

IC 74LS00 SOP 225MIL

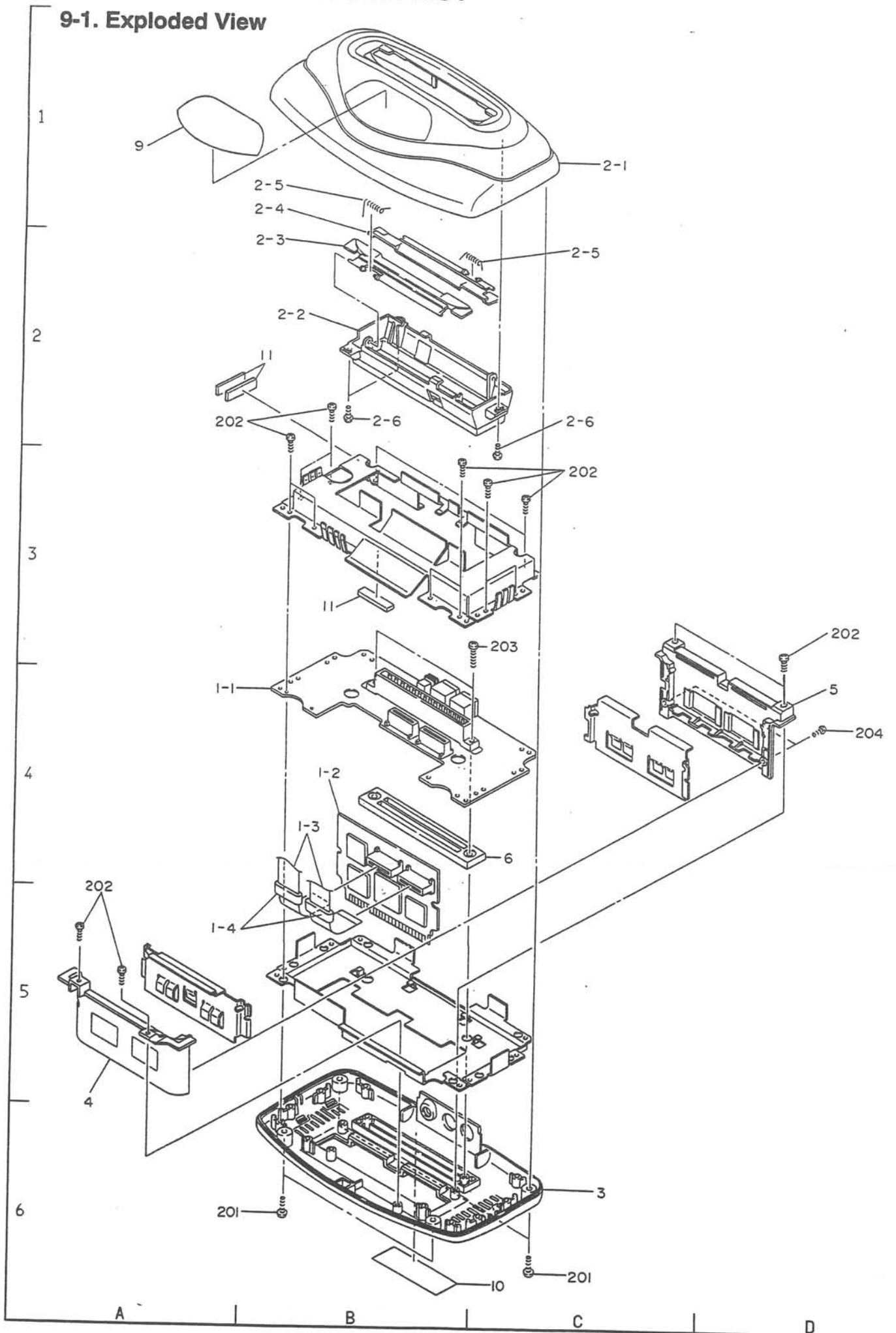
Parts No. : 314-0646

■ Top View



9. EXPLODED VIEW & PARTS LIST

9-1. Exploded View



9-2. Mechanical Parts List

9-3. Electrical Parts List

Ref. No.	Parts No.	Description	Circuit No.	Parts No.	Description
9-3-1. Main Circuit Board					
1	837-11294-01	IC BD MARS VA1 PAL [3]	IC1	315-0922	IC HD6417095F23 QFP
1	837-10924	IC BD MARS VAO NTSC [2]	IC1	315-0922A	IC HD6417095F28 QFP
1	837-11292-01	IC BD MARS VA1 NTSC [4]	IC1	315-0998	IC HD6417095SF28 QFP
1	837-11533	IC BD MARS VA1 ASIA NTSC [1]			
1-1	837-11293-01	IC BD MARS VA1 MAIN [3, 4]	IC2	315-0922	IC HD6417095F23 QFP
1-1	837-10925	IC BD MARS VAO MAIN [2]	IC2	315-0922A	IC HD6417095F28 QFP
1-1	837-11534	IC BD MARS VA1 MAIN JPN/ASIA [1]	IC2	315-0998	IC HD6417095SF28 QFP
1-2	837-10928-01	IC BD MARS VA1 PAL SUB [1, 3]			
1-2	837-10926	IC BD MARS VAO NTSC SUB [2, 4]	IC3	315-0910-12	IC UPD4502161G5-A12 TSOP
1-3	600-6413	FFC 40P L=70MM	IC3	315-1013	IC UPD4502161G5-VDP1-MARS TSOP
1-4	270-5092	FERITE CORE BP53RD065270080M			
2	610-5714	ASSY TOP CASE MARS JPN [1]	IC4	315-5818	IC CUSTOM CHIP G/A MARS 1/F
2	610-5765	ASSY TOP CASE MARS USA [2]	IC4	315-5818A	IC CUSTOM CHIP SCA MARS 1/F
2	610-5800	ASSY TOP CASE MARS EXPORT [3]			
2-1	253-6902	TOP CASE MARS [1]	IC5	315-5805	IC CUSTOM CHIP MARS ADSE
2-1	253-6902-02	TOP CASE MARS USA [2]	IC6	315-5781	IC CUSTOM CHIP G/A MARS VDP
2-1	253-6902-01	TOP CASE MARS EXPORT [3]	IC6	315-5781A	IC CUSTOM CHIP SCA MARS VDP
2-2	253-6906	COVER MARS	IC7	315-0745-80	IC TC511664BJ-80 SOJ
2-3, 4	253-6907	DOOR MARS [1]	IC7	315-0961-80	IC LC321664AJ-80 SOJ
2-3	253-6908	FRONT DOOR MARS EXPORT [2, 3]	IC7	315-0962-80	IC LC321664AM-80 SOP
2-4	253-6909	BACK DOOR MARS EXPORT [2, 3]			
2-5	125-5128	SPRING MARS	IC8	315-0745-80	IC TC511664BJ-80 SOJ
2-6	029-000034	B-TITE SCR PH 3X8	IC8	315-0961-80	IC LC321664AJ-80 SOJ
			IC8	315-0962-80	IC LC321664AM-80 SOP
3	253-6903	BOTTOM CASE MARS	IC9	314-0694	IC 74AC04 SOP 300MIL
4	610-5807	ASSY FRONT CASE MARS [1, 2, 3]	IC10	313-5320	IC RH5RL33A
4	253-6904	FRONT CASE MARS			
4-2	250-5410	UNDER PLATE MARS	CE1	153-0119	CAP TANT CHIP 47UF 10V
			CE1	153-0119-01	CAP TANT CHIP 47UF 10V
5	610-5808	ASSY REAR CASE MARS	CE2	153-0119	CAP TANT CHIP 47UF 10V
5	253-6905	REAR CASE MARS	CE2	153-0119-01	CAP TANT CHIP 47UF 10V
5-2	250-5410	UNDER PLATE MARS			
6	253-6599	64P COVER MD2 EXPORT	CN1	209-5076	FFC CNN 40P SOP
9	670-5338	LABEL MD 32X LOGO ASIA [1]	CN1	209-5076-01	FFC CNN 40P SOP <VA1>
9	670-5339	LABEL MD 32X LOGO MUL [3]	CN1	209-5076-02	FFC CNN 40P SOP <VA1>
10	670-5864	LABEL INDICATION MARS ASIA PAL [1]	CN2	209-5076	FFC CNN 40P SOP
10	670-5341	LABEL INDICATION MARS USA [2]	CN2	209-5076-01	FFC CNN 40P SOP <VA1>
10	670-5341-01	LABEL INDICATION GEN 32X USA 01 [4]	CN2	209-5076-02	FFC CNN 40P SOP <VA1>
10	670-5341-01A	LABEL INDICATION 32X USA 01A [4]			
10	670-5342	LABEL INDICATION MARS 32X MUL [3]	FB1	271-0092	BEADS INDUCTOR CP BK1608HS121
			FB2	476-1000-J-16	RES CHIP 0 OHM 1/16W
			FB3	271-0075	BEADS INDUCTOR CP BK1608HS241
			FB5	476-1000-J-16	RES CHIP 0 OHM 1/16W
			FB6	271-0092	BEADS INDUCTOR CP BK1608HS121
201	029-000035-0B	B-TITE SCR PH BLK 3X10	L1	180-5137-01	P. COIL CHIP 100UH ELJFA101KF
202	029-000034	B-TITE SCR PH 3X8	L1	180-5137-02	P. COIL CHIP 100UH LEM3225T101K
203	029-000047	B-TITE SCR PH 3X16	L1	180-5137-03	P. COIL CP 100UH NL322522-101J
204	029-000048-0B	B-TITE SCR PH BLK 2X6	L1	180-5137	CHIP INDUCTOR 100UH 10% <VA1>
			L2	180-5137-01	P. COIL CHIP 100UH ELJFA101KF
			L2	180-5137-02	P. COIL CHIP 100UH LEM3225T101K
			L2	180-5137-03	P. COIL CP 100UH NL322522-101J
			L2	180-5137	CHIP INDUCTOR 100UH 10% <VA1>
			RM3	477-0175	R-PK CP 4*10KOHM 1/8W 5% <VA1>
			RM3	477-0175-01	R-PK CP 4*10KOHM 1/8W 5% <VA1>
			RM3	477-0175-02	R-PK CP 4*10KOHM 1/8W 5% <VA1>
			RM4	477-0175	R-PK CP 4*10KOHM 1/8W 5% <VA1>
			RM4	477-0175-01	R-PK CP 4*10KOHM 1/8W 5% <VA1>
			RM4	477-0175-02	R-PK CP 4*10KOHM 1/8W 5% <VA1>
			RM5	477-0175	R-PK CP 4*10KOHM 1/8W 5% <VA1>
			RM5	477-0175-01	R-PK CP 4*10KOHM 1/8W 5% <VA1>
			RM5	477-0175-02	R-PK CP 4*10KOHM 1/8W 5% <VA1>
			RM6	477-0175	R-PK CP 4*10KOHM 1/8W 5% <VA1>
			RM6	477-0175-01	R-PK CP 4*10KOHM 1/8W 5% <VA1>
			RM6	477-0175-02	R-PK CP 4*10KOHM 1/8W 5% <VA1>
			R1	NOT USED	NOT USED

[Note] [1].....ASIA PAL [2].....USA, CANADA VAO
[3].....PAL G/I [4].....USA, CANADA VA1

Circuit No.	Parts No.	Description	Circuit No.	Parts No.	Description
R2	476-1103-J-16	RES CHIP 10KOHM 1/16W 5%	C27	151-0614-01	CAP CER CP 4.7UF EMK316F475Z <VA1>
R3	476-1302-J-16	RES CHIP 3KOHM 1/16W 5%	C27	151-0615	CAP CER CP 3.3UF 16V ZF3216NEC
R4	NOT USED	NOT USED	C27	151-0615-01	CAP CER CP 3.3UF 16V Z3216TOKI <VA1>
R5	476-1302-J-16	RES CHIP 3KOHM 1/16W 5%	C28	151-0405	CAP CER CP 0.1UF 16V ZF1608
R6	476-1181-J-16	RES CHIP 180 OHM 1/16W 5%	C29	151-0405	CAP CER CP 0.1UF 16V ZF1608
R7	476-1133-G-16	RES CHIP 13KOHM 1/16W 2%	C30	151-0614	CAP CER CP 4.7UF 10V ZF3216
R8	476-1272-G-16	RES CHIP 2.7KOHM 1/16W 2%	C30	151-0614-01	CAP CER CP 4.7UF EMK316F475Z <VA1>
R9	476-1162-G-16	RES CHIP 1.6KOHM 1/16W 2%	C30	151-0615	CAP CER CP 3.3UF 16V ZF3216NEC
R61	476-1822-J-16	RES CHIP 8.2KOHM 1/16W 5%	C30	151-0615-01	CAP CER CP 3.3UF 16V Z3216TOKI <VA1>
R62	476-1202-J-16	RES CHIP 2KOHM 1/16W 5%	C31	151-0405	CAP CER CP 0.1UF 16V ZF1608
R63	NOT USED	NOT USED	C32	151-0405	CAP CER CP 0.1UF 16V ZF1608
R64	NOT USED	NOT USED	C33	151-0405	CAP CER CP 0.1UF 16V ZF1608
R65	NOT USED	NOT USED	C34	151-0614	CAP CER CP 4.7UF 10V ZF3216
R66	479-0472	RES 4.7KOHM 1/6W 5%	C34	151-0614-01	CAP CER CP 4.7UF EMK316F475Z <VA1>
C1	151-0405	CAP CER CP 0.1UF 16V ZF1608	C34	151-0615	CAP CER CP 3.3UF 16V ZF3216NEC
C2	151-0613	CAP CER CP 68PF 25V CH1608	C34	151-0615-01	CAP CER CP 3.3UF 16V Z3216TOKI <VA1>
C3	NOT USED	NOT USED	C35	151-0405	CAP CER CP 0.1UF 16V ZF1608
C4	NOT USED	NOT USED	C36	151-0405	CAP CER CP 0.1UF 16V ZF1608
C5	NOT USED	NOT USED	C37	151-0614	CAP CER CP 4.7UF 10V ZF3216
C6	151-0614	CAP CER CP 4.7UF 10V ZF3216	C37	151-0614-01	CAP CER CP 4.7UF EMK316F475Z <VA1>
C6	151-0614-01	CAP CER CP 4.7UF EMK316F475Z <VA1>	C37	151-0615	CAP CER CP 3.3UF 16V ZF3216NEC
C6	151-0615	CAP CER CP 3.3UF 16V ZF3216NEC	C37	151-0615-01	CAP CER CP 3.3UF 16V Z3216TOKI <VA1>
C6	151-0615-01	CAP CER CP 3.3UF 16V Z3216TOKI <VA1>	C38	151-0405	CAP CER CP 0.1UF 16V ZF1608
C7	151-0405	CAP CER CP 0.1UF 16V ZF1608	C39	151-0405	CAP CER CP 0.1UF 16V ZF1608
C8	151-0614	CAP CER CP 4.7UF 10V ZF3216	C40	151-0405	CAP CER CP 0.1UF 16V ZF1608
C8	151-0614-01	CAP CER CP 4.7UF EMK316F475Z <VA1>	C41	151-0405	CAP CER CP 0.1UF 16V ZF1608
C8	151-0615	CAP CER CP 3.3UF 16V ZF3216NEC	C42	151-0405	CAP CER CP 0.1UF 16V ZF1608
C8	151-0615-01	CAP CER CP 3.3UF 16V Z3216TOKI <VA1>	C43	151-0405	CAP CER CP 0.1UF 16V ZF1608
C9	151-0405	CAP CER CP 0.1UF 16V ZF1608	C44	151-0405	CAP CER CP 0.1UF 16V ZF1608
C10	151-0405	CAP CER CP 0.1UF 16V ZF1608	C45	151-0614	CAP CER CP 4.7UF 10V ZF3216
C11	151-0612	CAP CER CP 470PF 50V CH1608	C45	151-0614-01	CAP CER CP 4.7UF EMK316F475Z <VA1>
C12	151-0614	CAP CER CP 4.7UF 10V ZF3216	C45	151-0615	CAP CER CP 3.3UF 16V ZF3216NEC
C12	151-0614-01	CAP CER CP 4.7UF EMK316F475Z <VA1>	C45	151-0615-01	CAP CER CP 3.3UF 16V Z3216TOKI <VA1>
C12	151-0615	CAP CER CP 3.3UF 16V ZF3216NEC	C46	151-0614	CAP CER CP 4.7UF 10V ZF3216
C12	151-0615-01	CAP CER CP 3.3UF 16V Z3216TOKI <VA1>	C46	151-0614-01	CAP CER CP 4.7UF EMK316F475Z <VA1>
C13	151-0405	CAP CER CP 0.1UF 16V ZF1608	C46	151-0615	CAP CER CP 3.3UF 16V ZF3216NEC
C14	151-0612	CAP CER CP 470PF 50V CH1608	C46	151-0615-01	CAP CER CP 3.3UF 16V Z3216TOKI <VA1>
C15	151-0614	CAP CER CP 4.7UF 10V ZF3216	C47	151-0405	CAP CER CP 0.1UF 16V ZF1608
C15	151-0614-01	CAP CER CP 4.7UF EMK316F475Z <VA1>	C48	151-0405	CAP CER CP 0.1UF 16V ZF1608
C15	151-0615	CAP CER CP 3.3UF 16V ZF3216NEC	C50	151-0614	CAP CER CP 4.7UF 10V ZF3216
C15	151-0615-01	CAP CER CP 3.3UF 16V Z3216TOKI <VA1>	C50	151-0614-01	CAP CER CP 4.7UF EMK316F475Z <VA1>
C16	151-0405	CAP CER CP 0.1UF 16V ZF1608	C50	151-0615	CAP CER CP 3.3UF 16V ZF3216NEC
C17	151-0614	CAP CER CP 4.7UF 10V ZF3216	C50	151-0615-01	CAP CER CP 3.3UF 16V Z3216TOKI <VA1>
C17	151-0614-01	CAP CER CP 4.7UF EMK316F475Z <VA1>	C51	151-0614	CAP CER CP 4.7UF 10V ZF3216
C17	151-0615	CAP CER CP 3.3UF 16V ZF3216NEC	C51	151-0614-01	CAP CER CP 4.7UF EMK316F475Z <VA1>
C17	151-0615-01	CAP CER CP 3.3UF 16V Z3216TOKI <VA1>	C51	151-0615	CAP CER CP 3.3UF 16V ZF3216NEC
C18	151-0405	CAP CER CP 0.1UF 16V ZF1608	C51	151-0615-01	CAP CER CP 3.3UF 16V Z3216TOKI <VA1>
C19	151-0405	CAP CER CP 0.1UF 16V ZF1608	C52	NOT USED	NOT USED
C20	151-0614	CAP CER CP 4.7UF 10V ZF3216	C53	151-0620	CAP CER CP 100PF 50V CH1608 <VA1>
C20	151-0614-01	CAP CER CP 4.7UF EMK316F475Z <VA1>	C53	151-0253	CAP CER AX 100PF 50V <VA0>
C20	151-0615	CAP CER CP 3.3UF 16V ZF3216NEC	C53	151-0629	CAP CER AXIAL 120PF 50V BK <VA0>
C20	151-0615-01	CAP CER CP 3.3UF 16V Z3216TOKI <VA1>	C96	151-0251	CAP CER AX 47PF 50V
C21	151-0405	CAP CER CP 0.1UF 16V ZF1608	C96	151-0253	CAP CER AX 100PF 50V <VA1>
C22	151-0405	CAP CER CP 0.1UF 16V ZF1608	C97	151-0251	CAP CER AX 47PF 50V
C23	151-0614	CAP CER CP 4.7UF 10V ZF3216	C97	151-0253	CAP CER AX 100PF 50V <VA1>
C23	151-0614-01	CAP CER CP 4.7UF EMK316F475Z <VA1>			
C23	151-0615	CAP CER CP 3.3UF 16V ZF3216NEC			
C23	151-0615-01	CAP CER CP 3.3UF 16V Z3216TOKI <VA1>			
C25	151-0613	CAP CER CP 68PF 25V CH1608			
C26	151-0610	CAP CER CP 120PF 25V CH1608 <VA0>			
C26	151-0620	CAP CER CP 100PF 50V CH1608 <VA1>			
C27	151-0614	CAP CER CP 4.7UF 10V ZF3216			

Circuit No.	Parts No.	Description	Circuit No.	Parts No.	Description
9-3-2. Sub Circuit Board			L6	180-5157	[B]
IC11	315-5684	IC CUSTOM CP BA6166FS SOP	L7	180-5141	CHOKE COIL 300UH
IC12	315-5788	IC BA7237FS	L7	180-5141-01	CHOKE COIL 330UH LHL13TB331K
IC12	315-5788A	IC BA7237FSA	L7	180-5148	CHOKE COIL 330UH
IC13	313-5244	IC MC34063A SOP 8P	NF1	271-0007	EMI FILTER STX222MB
IC13	313-5335	IC IR3M03AN SOP 8P	NF2	271-0007	EMI FILTER STX222MB
IC14	313-5319	IC PST993E 3P DIP	RA1	477-0170	R-PK CP 8*10KOHM 1/16W 5% W/C
IC15	314-0647	IC 74HC74 SOP 225MIL	RA1	477-0170-02	R-PK CP 8*10KOHM 1/16W 5% W/C
IC16	314-0646	IC 74LS00 SOP 225MIL	RA2	477-0170	R-PK CP 8*10KOHM 1/16W 5% W/C
D1	481-5170	DIODE 1SR139-100T-62 AXIAL	RA2	477-0170-02	R-PK CP 8*10KOHM 1/16W 5% W/C
D2	481-0149-01	DIODE 1S2473 RADIAL	TR1	482-5126	XSTR 2SC1623 L5..7 CHIP
CE3	150-0023	CAP E 10UF 16V U-TYPE 20%	TR2	482-5126	XSTR 2SC1623 L5..7 CHIP
CE4	150-0023	CAP E 10UF 16V U-TYPE 20%	TR3	482-5126	XSTR 2SC1623 L5..7 CHIP
CE5	150-0023	CAP E 10UF 16V U-TYPE 20%	TR4	482-5126	XSTR 2SC1623 L5..7 CHIP
CE6	150-0062	CAP E 47UF 10V U-TYPE	TR5	313-5321	IC FX401
CE7	150-0062	CAP E 47UF 10V U-TYPE	X1	230-5187	XTAL 3.579545MHZ 20PPM
CE8	150-0062	CAP E 47UF 10V U-TYPE	X1	230-5191	XTAL 4.43361875MHZ 20PPM
CE9	150-0062	CAP E 47UF 10V U-TYPE	R11	476-1750-J-16	RES CHIP 75 OHM 1/16W 5%
CE10	150-0062	CAP E 47UF 10V U-TYPE	R12	476-1750-J-16	RES CHIP 75 OHM 1/16W 5%
CE11	150-0009	CAP E 1UF 50V U-TYPE 20%	R13	476-1822-J-16	RES CHIP 8.2KOHM 1/16W 5%
CE12	150-0159	CAP E 220UF 16V U-TYPE	R14	476-1302-J-16	RES CHIP 3KOHM 1/16W 5%
CE13	150-0009	CAP E 1UF 50V U-TYPE 20%	R15	476-1822-J-16	RES CHIP 8.2KOHM 1/16W 5%
CE14	150-0047	CAP E 100UF 10V U-TYPE	R16	476-1302-J-16	RES CHIP 3KOHM 1/16W 5%
CE15	150-0062	CAP E 47UF 10V U-TYPE	R17	476-1822-J-16	RES CHIP 8.2KOHM 1/16W 5%
CE16	150-0159	CAP E 220UF 16V U-TYPE	R18	476-1103-J-16	RES CHIP 10KOHM 1/16W 5%
CE17	150-0484	CAP E 470UF 10V U-TYPE	R19	476-1822-J-16	RES CHIP 8.2KOHM 1/16W 5%
CE18	150-0498	CAP OS 100UF 10V 20% 10SA100M	R20	476-1103-J-16	RES CHIP 10KOHM 1/16W 5%
CE19	150-0047	CAP E 100UF 10V U-TYPE	R21	476-1331-J-16	RES CHIP 330 OHM 1/16W 5%
CE20	150-0047	CAP E 100UF 10V U-TYPE	R22	476-1331-J-16	RES CHIP 330 OHM 1/16W 5%
CF1	270-5086	COMMON FILTER CM04RC01T	R23	476-1472-J-16	RES CHIP 4.7KOHM 1/16W 5%
CN3	209-5026	EDGE CONNECTOR 64P	R24	476-1100-J-16	RES CHIP 10 OHM 1/16W 5%
CN3	209-5061	EDGE CONNECTOR 64P PSB4D32K-7R	R25	476-1222-J-16	RES CHIP 2.2KOHM 1/16W 5%
CN3	209-5063	EDGE CONNECTOR 64P	R26	476-1750-J-16	RES CHIP 75 OHM 1/16W 5%
CN4	209-5076	FFC CNN 40P SOP	R27	476-1750-J-16	RES CHIP 75 OHM 1/16W 5%
CN5	209-5076	FFC CNN 40P SOP	R28	476-1750-J-16	RES CHIP 75 OHM 1/16W 5%
CN6	212-5364	MINI DIN CONN 9P TCS7913-43	R29	476-1750-J-16	RES CHIP 75 OHM 1/16W 5%
CN6	212-5364-01	MINI DIN CONN 9P/C MD-S9200-90	R30	476-1750-J-16	RES CHIP 75 OHM 1/16W 5%
CN7	212-5364	MINI DIN CONN 9P TCS7913-43	R31	476-1750-J-16	RES CHIP 75 OHM 1/16W 5%
CN7	212-5364-01	MINI DIN CONN 9P/C MD-S9200-90	R32	476-1330-J-16	RES CHIP 33 OHM 1/16W 5%
CN8	212-5353	CONN DC JACK EIAJ3 HEC3100	R33	476-1330-J-16	RES CHIP 33 OHM 1/16W 5%
CN8	212-5353-01	CONN DC JACK EIAJ3 UC0086	R34	476-1330-J-16	RES CHIP 33 OHM 1/16W 5%
FB10	476-1000-J-16	RES CHIP 0 OHM 1/16W	R35	476-1161-J-16	RES CHIP 160 OHM 1/16W 5%
FB11	476-1000-J-16	RES CHIP 0 OHM 1/16W	R36	476-1161-J-16	RES CHIP 160 OHM 1/16W 5%
FB12	476-1000-J-16	RES CHIP 0 OHM 1/16W	R37	476-1161-J-16	RES CHIP 160 OHM 1/16W 5%
FB13	476-1000-J-16	RES CHIP 0 OHM 1/16W	R38	NOT USED	NOT USED
FB14	476-1000-J-16	RES CHIP 0 OHM 1/16W	R39	476-1302-J-16	RES CHIP 3KOHM 1/16W 5%
FB15	476-1000-J-16	RES CHIP 0 OHM 1/16W	R40	476-1431-J-16	RES CHIP 430 OHM 1/16W 5%
FB16	476-1000-J-16	RES CHIP 0 OHM 1/16W	R40	476-1561-J-16	RES CHIP 560 OHM 1/16W 5%
FB17	476-1000-J-16	RES CHIP 0 OHM 1/16W	R41	476-1122-J-16	RES CHIP 1.2KOHM 1/16W 5%
L3	180-5059	PEAKING COIL 12UH LAL03	R41	476-1681-J-16	RES CHIP 680 OHM 1/16W 5%
L3	180-5158	PEAKING COIL 12UH ELEPK120KA	R42	476-1102-J-16	RES CHIP 1KOHM 1/16W 5%
L4	180-5059	PEAKING COIL 12UH LAL03	R42	NOT USED	NOT USED
L4	180-5147	PEAKING COIL 10UH LAL03	R43	476-1102-J-16	RES CHIP 1KOHM 1/16W 5%
L4	180-5159	PEAKING COIL 10UH ELEPK100KA	R43	NOT USED	NOT USED
L5	180-5060	PEAKING COIL 100UH 03RA	R44	476-1750-J-16	RES CHIP 75 OHM 1/16W 5%
L5	180-5151	PEAKING COIL 82UH LAL03	R45	476-1000-J-16	RES CHIP 0 OHM 1/16W
L5	180-5157	PEAKING COIL 100UH ELEPK101KA	R46	NOT USED	NOT USED
L5	180-5160	PEAKING COIL 82UH ELEPK820KA	R47	476-1101-J-16	RES CHIP 100 OHM 1/16W 5%
L6	180-5059	PEAKING COIL 12UH LAL03	R48	NOT USED	NOT USED
			R49	476-1103-J-16	RES CHIP 10KOHM 1/16W 5%
			R50	476-8R13-J-01	RES CHIP 0.13OHM 1W 5%
			R51	476-1561-J-16	RES CHIP 560 OHM 1/16W 5%

[Note] [A] PAL [B] NTSC

9-4. Accessories/Package List

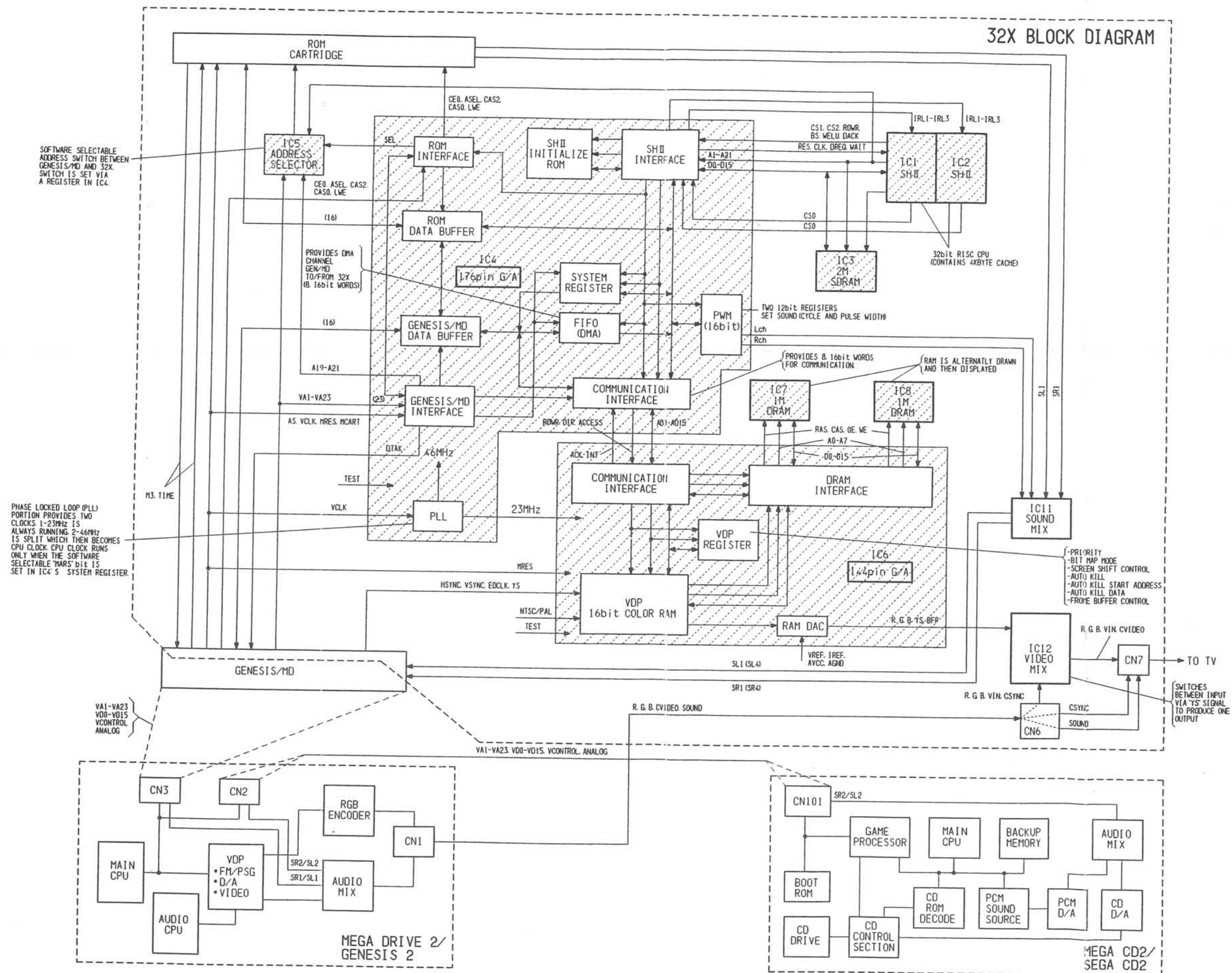
Circuit No.	Parts No.	Description	No.	Parts No.	Description
R52	476-8221-J-01	RES CHIP 220 OHM 1W 5%	9-4-1. USA,CANADA		
R53	476-1103-G-16	RES CHIP 10KOHM 1/16W 2%	1	400-5135A	AC ADAPTOR AC120V/DC10V 0.85A
R54	476-1332-G-16	RES CHIP 3.3KOHM 1/16W 2%	1	400-5135A-01	AC ADAPTOR AC120V/DC10V 0.85A
R55	476-1103-J-16	RES CHIP 10KOHM 1/16W 5%	1	400-5135A-02	AC ADAPTOR AC120V/DC10V 0.85A
R56	476-1472-J-16	RES CHIP 4.7KOHM 1/16W 5%	2	253-6923	MD2 HOLDER MARS
R57	476-1102-J-16	RES CHIP 1KOHM 1/16W 5%	3	250-5408	FRONT CONNECTOR MARS
R58	476-1103-J-16	RES CHIP 10KOHM 1/16W 5%	4	250-5409	REAR CONNECTOR MARS
R59	476-1202-J-16	RES CHIP 2KOHM 1/16W 5%	5	600-6323	VIDEO CABLE MD2 MONO W/CORE
R60	476-1163-J-16	RES CHIP 16KOHM 1/16W 5%	6	600-6412	A/V CABLE 8P/9P W/CORE
C54	151-0604	CAP CER CP 3300PF 50V BK1608	7	600-6411	A/V CABLE 9P/9P W/CORE
C55	151-0604	CAP CER CP 3300PF 50V BK1608	8	671-5440-03	BOX&PACK MARS USA DP 84003(W/STAR WARS)
C56	151-0410	CAP CER CP 680PF 50V BK1608	8	671-5440-02	BOX&PACK MARS USA DP 84002
C57	151-0410	CAP CER CP 680PF 50V BK1608	9	671-5659-03	BOX&PACK MARS USA PM 84003(W/STAR WARS)
C58	151-0409	CAP CER CP 1000PF 50V BK1608	9	671-5659-02	BOX&PACK MARS USA PM 84002
C59	151-0413	CAP CER CP 2200PF 50V KB1608	10	671-5611-02	MA CTN MARS USA 84002
C60	151-0409	CAP CER CP 1000PF 50V BK1608	10	671-5611-03	MA CTN MARS USA 84003(W/STAR WARS)
C61	151-0413	CAP CER CP 2200PF 50V KB1608	11	670-5874	MANUAL HARD GENESIS 32X USA
C62	151-0409	CAP CER CP 1000PF 50V BK1608	12	670-5726	BUSINESS REPLY MAIL MARS USA
C63	151-0405	CAP CER CP 0.1UF 16V ZF1608	13	SGM-4216	POLY BAG 260*320*0.05 EXP 6
C64	151-0405	CAP CER CP 0.1UF 16V ZF1608	14	SGM-4217	POLY BAG 200*300*0.05 EXP 6
C65	151-0405	CAP CER CP 0.1UF 16V ZF1608	15	SGM-4282	POLY BAG 95*165*0.03
C66	151-0405	CAP CER CP 0.1UF 16V ZF1608	16	670-5777	PERIPHERAL CATALOG GENESIS 32X
C67	151-0405	CAP CER CP 0.1UF 16V ZF1608	17	610-5796	ASSY MARS EXTENSION UNIT
C68	151-0405	CAP CER CP 0.1UF 16V ZF1608	18	SGM-4324	POLY BAG 70*180*0.04
C69	151-0405	CAP CER CP 0.1UF 16V ZF1608	19	670-5862	INFOR SHEET EXTENSION UNIT
C70	151-0432	CAP CER CP 47PF 50V CH1608 [B]	9-4-2. PAL		
C70	151-0613	CAP CER CP 68PF 25V CH1608 [A]	1	400-5208	AC ADAP. 240V 50HZ/10VDC 0.85A[F]
C71	151-0430	CAP CER CP 10PF 50V CH1608	1	400-5209	AC ADAP. 230V 50HZ/10VDC 0.85A[A, B, D, G]
C72	151-5003-01	CAP CER TRIMMER 10PF	1	400-5211	AC ADAP. 240V/DC9V 0.85A [C, E]
C73	151-0482	CAP CER CP 82PF 50V CH1608	2	610-5473	RF UNIT MD2 MDU-UD3631 [C, D, F]
C74	151-0436	CAP CER CP 15PF 50V JCH1608 [A]	2	610-5473-01	RF UNIT MD2 MDQT4E801A [C, D, F]
C74	151-0619	CAP CER CP 18PF 50V CH1608 [B]	2	610-5473-02	RF UNIT MD2 TOWA PAL-G/I [C, D, F]
C75	151-0432	CAP CER CP 47PF 50V CH1608 [A]	2	610-5493	RF UNIT MD2 PAL-B [E]
C75	151-0611	CAP CER CP 56PF 50V CH1608 [B]	3	253-6923	MD2 HOLDER MARS
C76	476-1000-J-16	RES CHIP 0 OHM 1/16W	4	250-5408	FRONT CONNECTOR MARS
C77	151-0607	CAP CER CP 0.047UF 16V BK1608	5	250-5409	REAR CONNECTOR MARS
C78	151-0482	CAP CER CP 82PF 50V CH1608 [A]	6	600-6412	A/V CABLE 8P/9P W/CORE [C, D, E, F, G]
C78	151-0620	CAP CER CP 100PF 50V CH1608 [B]	7	600-6411	A/V CABLE 9P/9P W/CORE
C79	151-0607	CAP CER CP 0.047UF 16V BK1608	8	671-5438-09	B&P SET MD 32X SWE 84204 DP [A]
C80	151-0405	CAP CER CP 0.1UF 16V ZF1608	8	671-5658-09	B&P SET MD 32X SWE 84204 PM [A]
C81	151-0405	CAP CER CP 0.1UF 16V ZF1608	9	671-5610-05	MA CTN MD 32X ASIA 84204 [A]
C82	151-0405	CAP CER CP 0.1UF 16V ZF1608	8	671-5438-08	B&P SET MD 32X MUL 84204 DP [B]
C83	151-0405	CAP CER CP 0.1UF 16V ZF1608	8	671-5658-08	B&P SET MD 32X MUL 84204 PM [B]
C84	151-0405	CAP CER CP 0.1UF 16V ZF1608	9	671-5610-05	MA CTN MD 32X ASIA 84204 [B]
C85	151-0612	CAP CER CP 470PF 50V CH1608	8	671-5438-02	B&P SET MD 32X MUL 84203 DP [C, E, F, G]
C86	151-0405	CAP CER CP 0.1UF 16V ZF1608	8	671-5658-02	B&P SET MD 32X MUL 84203 PM [C, E, F, G]
C87	151-0405	CAP CER CP 0.1UF 16V ZF1608	9	671-5610-02	MA CTN MD 32X MUL 84203 [C, E, F, G]
C88	151-0405	CAP CER CP 0.1UF 16V ZF1608	8	671-5438-01	B&P SET MD 32X MUL 84201 DP [C, D, E, F]
C89	151-0405	CAP CER CP 0.1UF 16V ZF1608	8	671-5658-01	B&P SET MD 32X MUL 84201 PM [C, D, E, F]
C90	151-0405	CAP CER CP 0.1UF 16V ZF1608	9	671-5610-01	MA CTN MD 32X MUL 84201 [C, D, E, F]
C91	151-0405	CAP CER CP 0.1UF 16V ZF1608	10	672-2147	MANUAL HARD MD 32X MUL
C92	151-0405	CAP CER CP 0.1UF 16V ZF1608	11	670-0863-03	MEMBERSHIP CARD SWEDEN 03 [A]
C93	151-0405	CAP CER CP 0.1UF 16V ZF1608	12	670-6036	INFOR SHEET CONTENTS 32X 84204 [A, B]
C94	NOT	NOT USED	13	670-6066	WARRANTY CARD OZI MD 32X AUS[C]
C95	151-0620	CAP CER CP 100PF 50V CH1608	13	670-6067	WARRANTY CARD OZI MD 32X NZL[E]
			14	670-5815	GUARANTEE CARD SOE MD 32X [D, F, G]
			15	SGM-4216	POLY BAG 260*320*0.05 EXP 6
			15	SGM-4331	POLY BAG 260*310*0.05 EXP 6

[Note] [A].....PAL [B].....NTSC

No.	Parts No.	Description	No.	Parts No.	Description
16	SGM-4217	POLY BAG 200*300*0.05 EXP 6			
16	SGM-4245	POLY BAG 200*310*0.05 EXP 6			
17	SGM-4282	POLY BAG 95*165*0.03			
18	670-6561	INFOR SHEET SET UP 32X MUL [A, B, D, F]			
18	670-6697	INFOR SHEET SET UP 32X SOZ [C, E]			
19	670-6588	LABEL CAUTION MARS MUL [C, D, E, F]			
【Note】 [A]....NORTHERN EUROPE [B]....EAST EUROPE [C]....AUSTRALIA [D]....GERMAN, SOE [E]....NEW ZEALAND [F]....UK [G]....SOE					
9-4-3. ASIA PAL					
1	400-5209	AC ADAP. 230V 50HZ/10VDC 0.85A			
2	253-6923	MD2 HOLDER MARS			
3	600-6187	VIDEO CABLE MD2 JAP MONO 2M [A]			
4	600-6412	A/V CABLE 8P/9P W/CORE [A]			
5	600-6411	A/V CABLE 9P/9P W/CORE			
6	210-5030	CONVERSION PLUG E-5 [C]			
7	671-5438-03	B&P SET MD 32X ASIA 84202 DP [A]			
8	671-5658-03	B&P SET MD 32X ASIA 84202 PM [A]			
9	671-5610-03	MA CTN MD 32X ASIA 84202 [A]			
7	671-5438-05	B&P SET MD 32X ASIA 84204 DP [B]			
8	671-5658-05	B&P SET MD 32X ASIA 84204 PM [B]			
9	671-5610-05	MA CTN MD 32X ASIA 84204 [B, C, D]			
7	671-5438-10	B&P SET MD 32X S. A 84204 DP [C]			
8	671-5658-10	B&P SET MD 32X S. A 84204 PM [C]			
7	671-5438-11	B&P SET MD 32X KSA 84204 DP [D]			
8	671-5658-11	B&P SET MD 32X KSA 84204 PM [D]			
10	672-2161	MANUAL HARD MD 32X ASIA			
11	SGM-4181	POLY BAG 260*320*0.05			
12	SGM-4185	POLY BAG 160*240*0.05			
【Note】 [A]....HONG KONG, SOUTHEAST ASIA [B]....SINGAPORE, HONG KONG [C]....SOUTH AFRICA [D]....SAUDI ARABIA, ISRAEL					

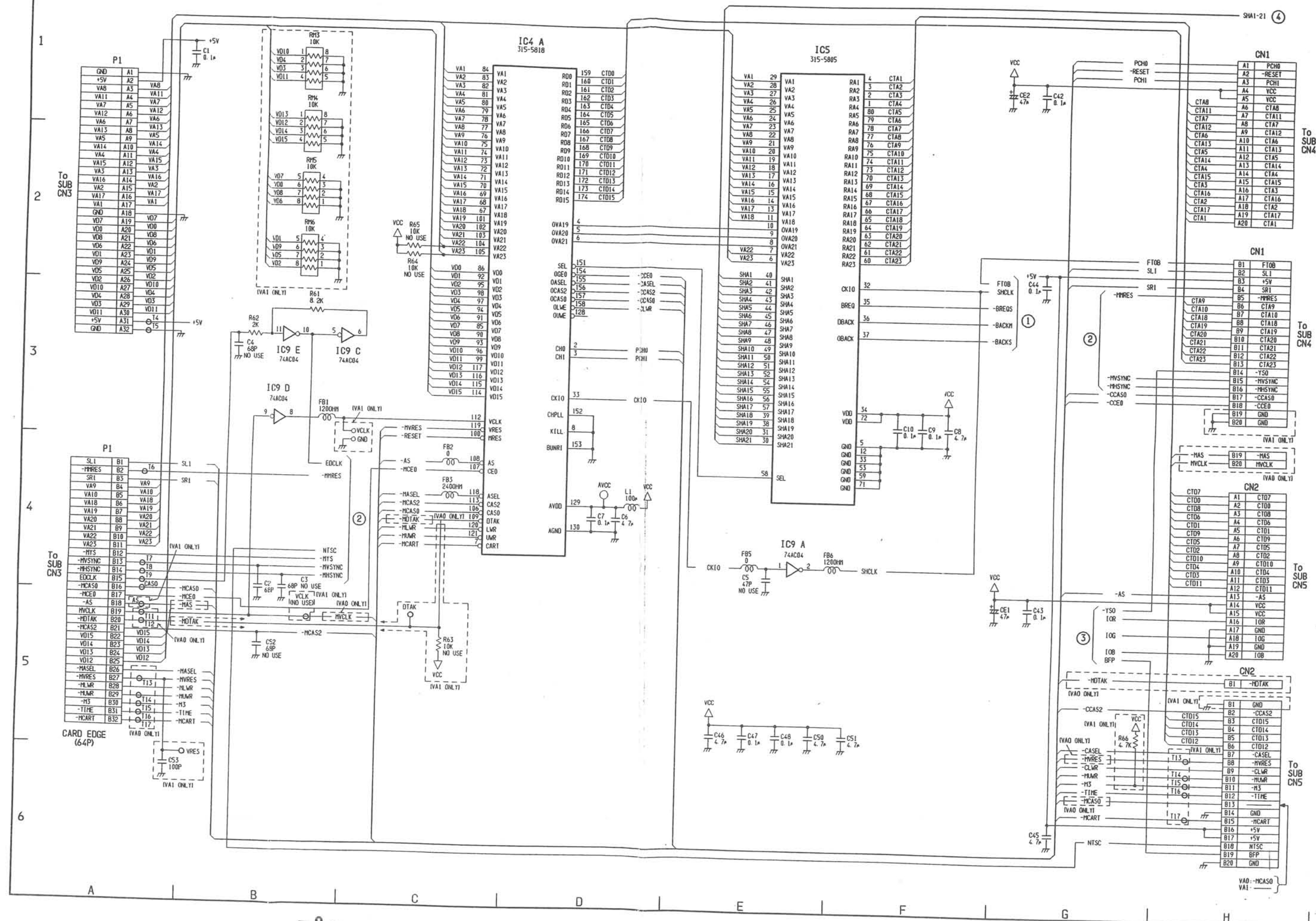


6. BLOCK DIAGRAM

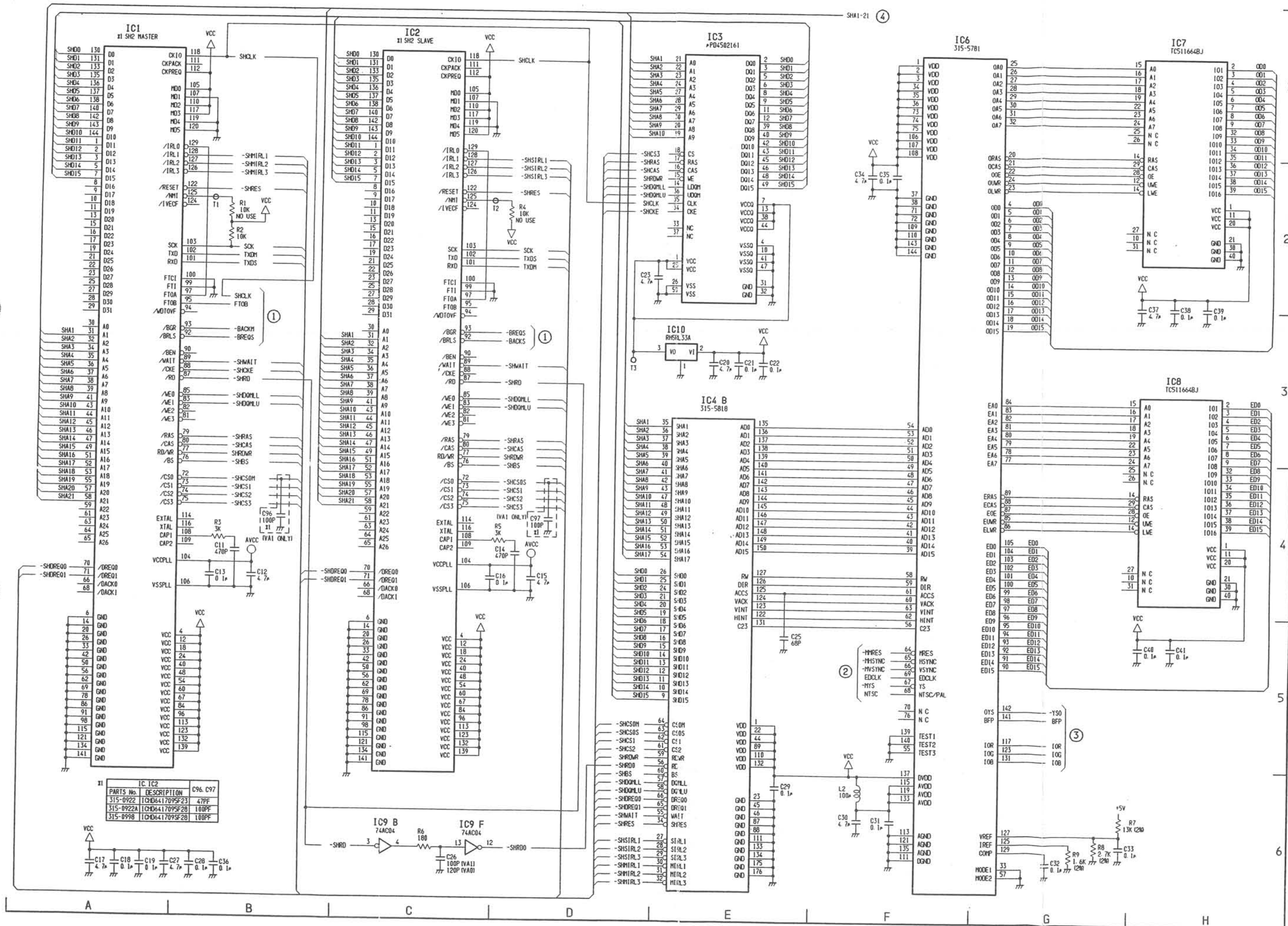


7. SCHEMATIC & CIRCUIT BOARD DIAGRAMS

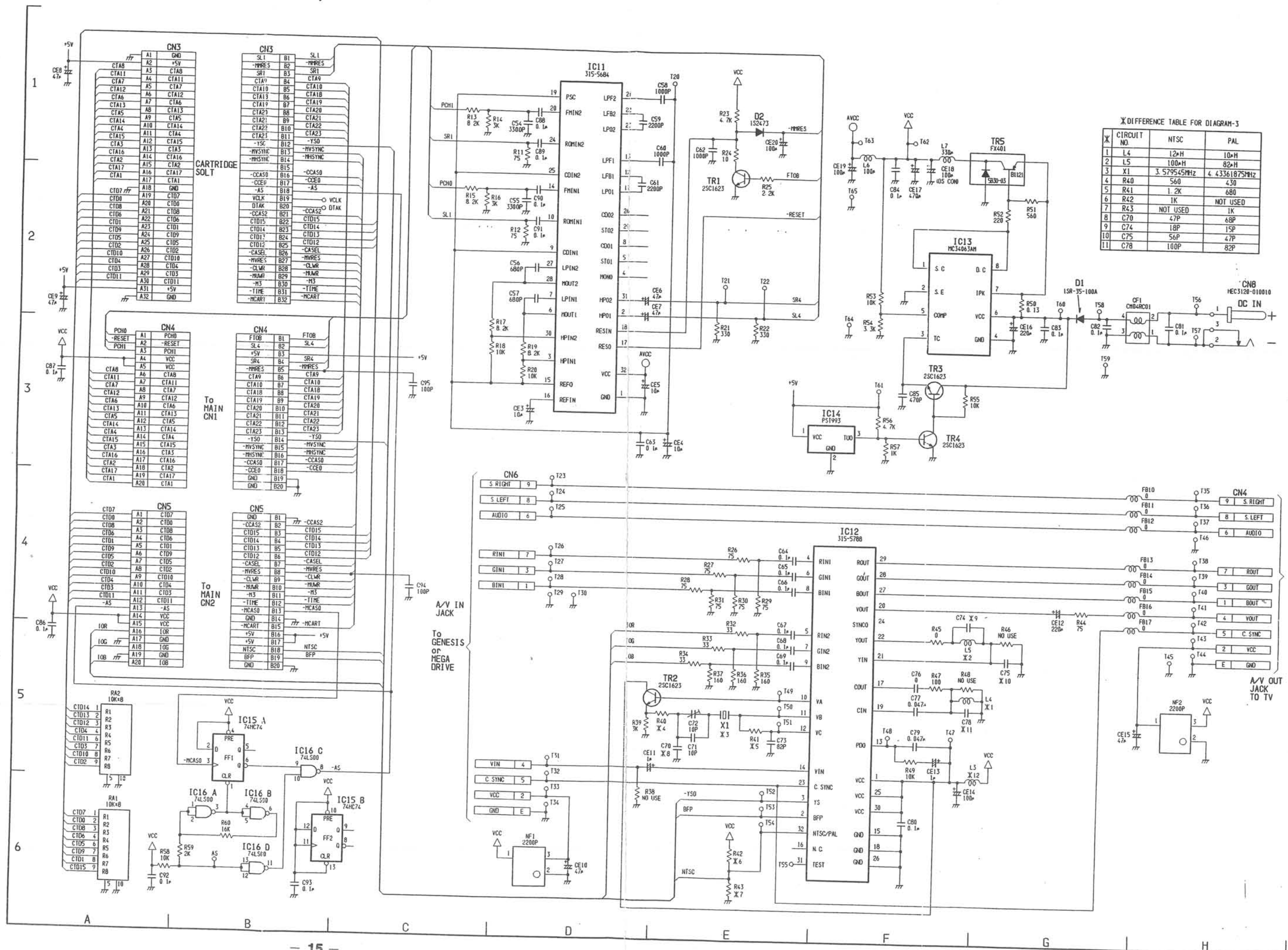
7-1. Schematic Diagram-1(Main Section - 1/2)

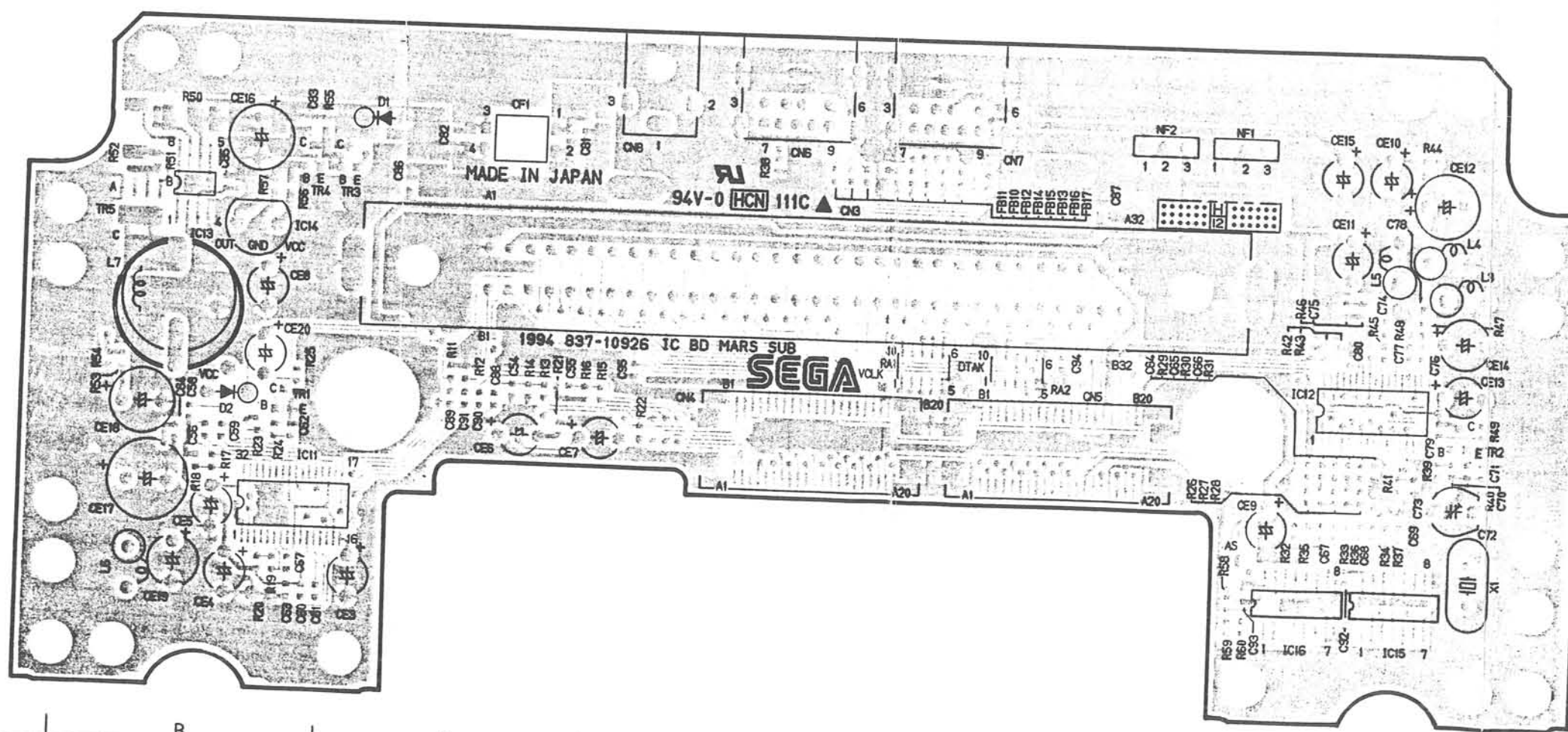
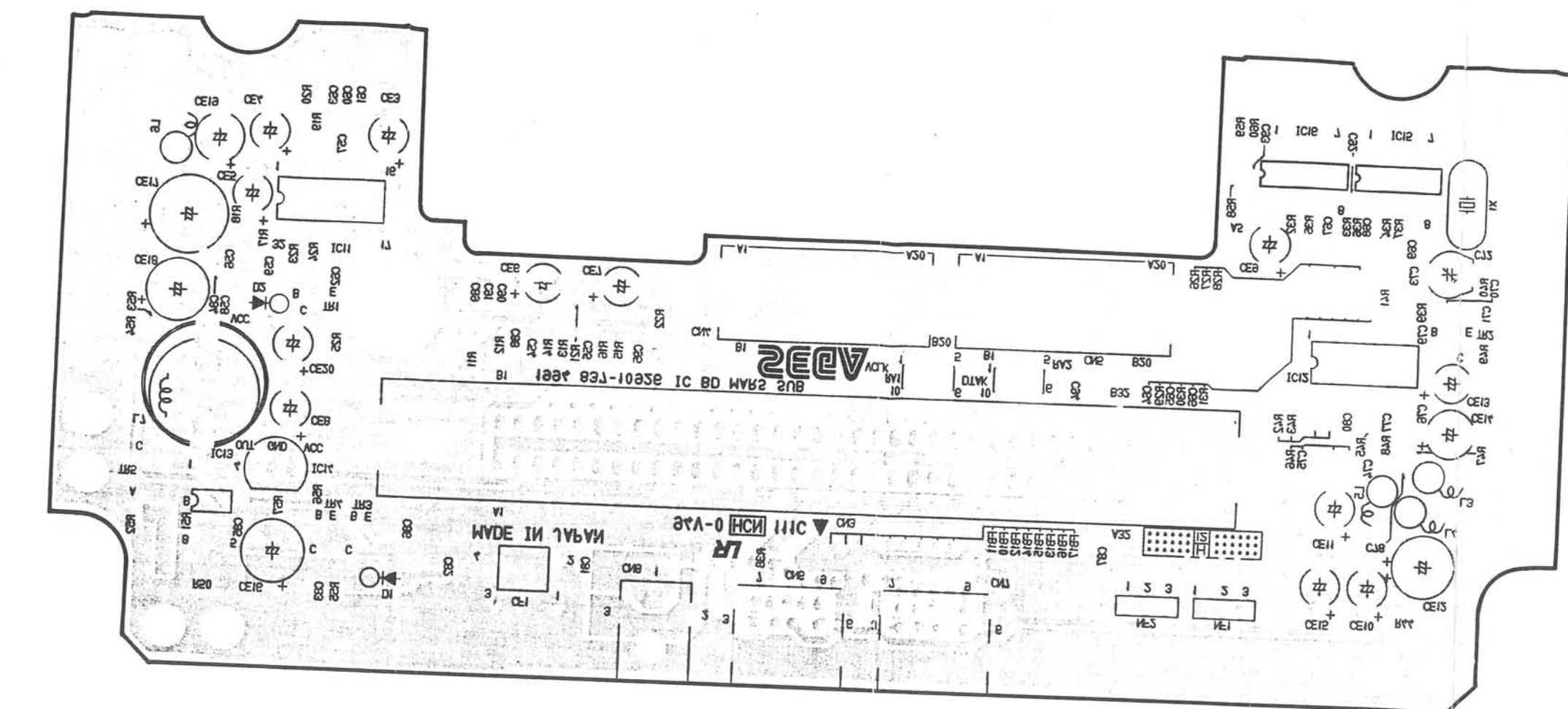


7-3. Schematic Diagram-2 (Main Section – 2/2)



7-4. Schematic Diagram-3 (Sub Section)





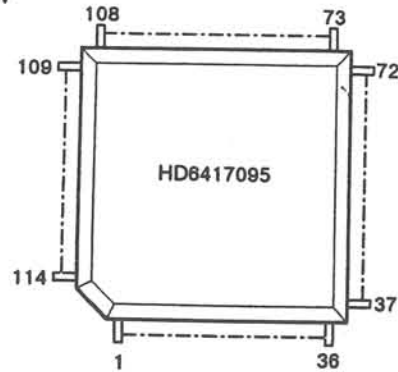
8. PARTS SPECIFICATIONS

IC1/2 CPU

IC HD6417095F23 QFP
Parts No. : 315-0922

IC HD6417095F28 QFP
Parts No. : 315-0922A

Top View



Description

No.	I/O	Pin Name	Function
1	I/O	D11	Data bus
2		D12	
3		D13	
4	—	VCC1	Power supply (5V)
5	I/O	D14	Data bus
6	—	VSS1	Power supply (0V)
7	I/O	D15	Data bus
8		D16	
9		D17	
10		D18	
11	I/O	D19	Data bus
12		D20	
13		D21	
14	—	VCC2	Power supply (5V)
15	I/O	D22	Data bus
16	—	VSS2	Power supply (0V)
17	I/O	D23	Data bus
18	—	VCC3	Power supply (5V)
19	I/O	D24	Data bus
20	—	VSS3	Power supply (0V)
21	I/O	D25	Data bus
22		D26	
23		D27	
24	—	VCC4	Power supply (5V)
25	I/O	D28	Data bus
26	—	VSS4	Power supply (0V)
27	I/O	D29	Data bus
28		D30	
29		D31	
30	I/O	A0	Address bus
31		A1	
32		A2	
33	—	VSS5	Power supply (0V)
34	I/O	A3	Address bus
35		A4	
36		A5	
37		A6	
38		A7	
39	I/O	A8	Address bus
40		VCC5	Power supply (5V)

No.	I/O	Pin Name	Function
41	I/O	A9	Address bus
42	—	VSS6	Power supply (5V)
43	I/O	A10	Address bus
44		A11	
45		A12	
46		A13	
47	—	A14	Address bus
48	—	VCC6	Power supply (5V)
49	I/O	A15	Address bus
50	—	VSS7	Power supply (0V)
51	I/O	A16	Address bus
52		A17	
53		A18	
54	—	VCC7	Power supply (5V)
55	I/O	A19	Address bus
56	—	VSS8	Power supply (0V)
57	I/O	A20	Address bus
58		A21	
59		A22	
60	—	VCC8	Power supply (5V)
61	I/O	A23	Address bus
62	—	VSS9	Power supply (0V)
63	I/O	A24	Address bus
64		A25	
65		A26	
66	O	DACK0	DMAC0 acknowledge
67	—	VCC9	Power supply (5V)
68	O	DACK1	DMAC1 acknowledge
69	—	VSS10	Power supply (0V)
70	I	DREQ0	DMAC0 request
71	I	DREQ1	DMAC1 request
72	O	CS0	Chip select 0
73	O	CS1	Chip select 1
74	O	CS2	Chip select 2
75	O	CS3	Chip select 3
76	I/O	BS	Bus cycle start
77	I/O	RD/WR	Read write
78	—	VSS11	Power supply (0V)
79	O	RAS, CE	RAS for DRAM/SDRAM/CE for PSRAM
80	O	CAS, OE	CAS for SDRAM/OE for PSRAM
81	O	CASHH, DQMUU, WE3	Each memory most significant byte select signal
82	O	CASHL, DQMUL, WE2	Each memory 2nd byte select signal
83	O	CASLH, DWMLU, WE1	Each memory 3rd byte select signal
84	—	VCC10	Power supply (5V)
85	O	CASLL, DQMLL, WE0	Each memory least significant byte select signal
86	—	VSS12	Power supply (0V)
87	O	RD	Read pulse
88	O	CKE	SDRAM clock enable control
89	I	WAIT	Hardware wait request.
90	O	BEN	Reserve
91	—	VSS13	Power supply (0V)
92	I	BACK, BRLS	Bus right permission in slave mode./Bus right acknowledge in master mode.
93	O	BREQ, BGR	Bus right request in slave mode./Bus right acknowledge in master mode.
94	O	WDTOVF	Watch dog timer output.
95	O	FTOB	Free-running timer output B.
96	—	VCC11	Power supply (5V)
97	O	FTOA	Free-running timer output A.
98	—	VSS14	Power supply (0V)
99	I	FTI	Free-running timer input.
100	I	FTCI	Free-running timer clock input.
101	I	RXD	Serial data input.
102	O	TXD	Serial data output.
103	I/O	SCK	Serial clock input/output.